American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

OCT. 12

PROGRESS 50 YEARS OF POWERED FLIGHT AND SECURITY
19 53

V.17 n.10

The Record Breakers 13

Second Source For the B-52 15

★

Technical Details On MiG-15 17

★

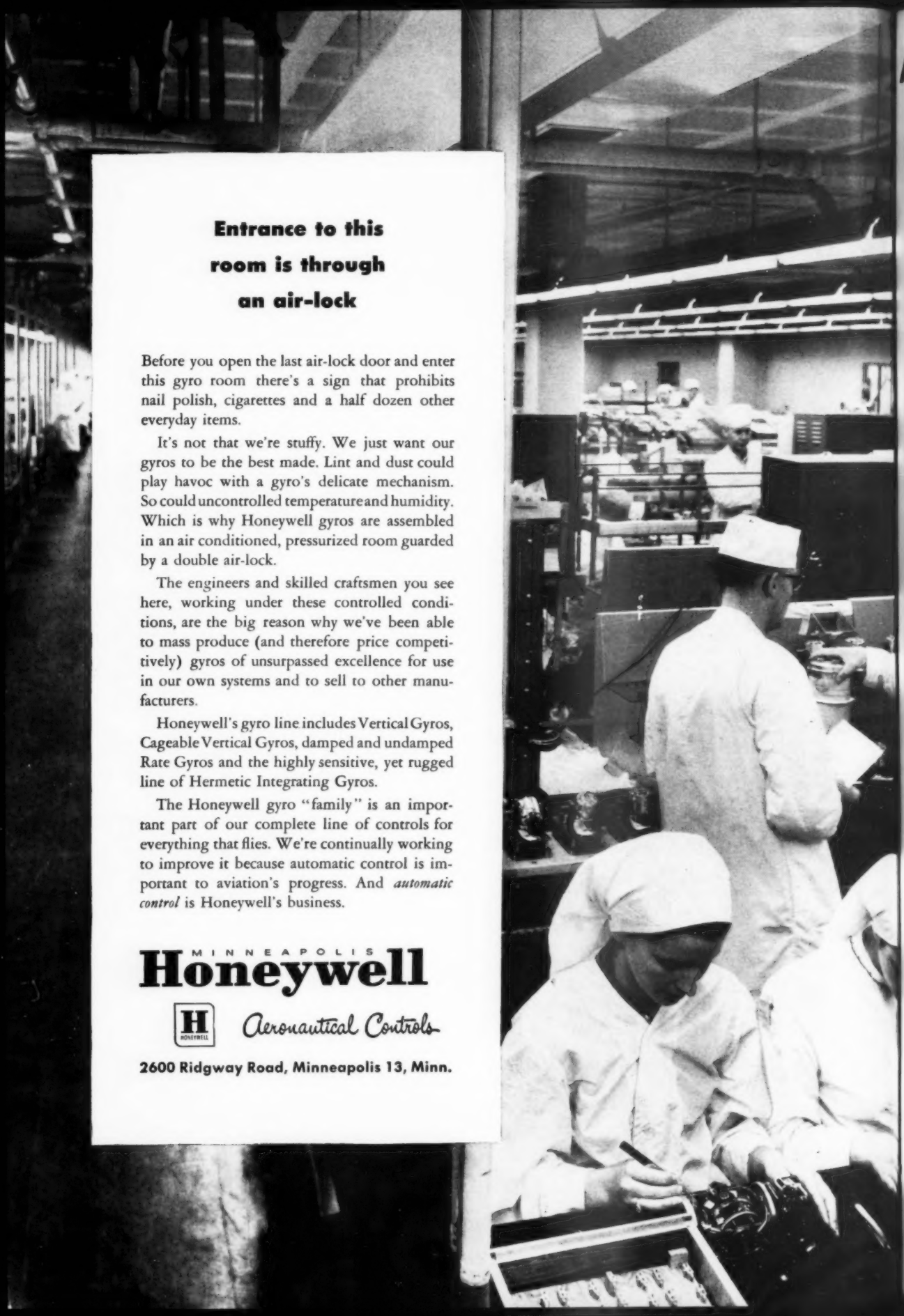
Can We Afford To Buy Jets? 22

★

New Look at the No-Show Problem . 26

★

DETROIT PUB LIB
TECHNOLOGY DEPT
96 PUTNAM AVE
DETROIT 2 MICH
5305 10-55 8



Entrance to this room is through an air-lock

Before you open the last air-lock door and enter this gyro room there's a sign that prohibits nail polish, cigarettes and a half dozen other everyday items.

It's not that we're stuffy. We just want our gyros to be the best made. Lint and dust could play havoc with a gyro's delicate mechanism. So could uncontrolled temperature and humidity. Which is why Honeywell gyros are assembled in an air conditioned, pressurized room guarded by a double air-lock.

The engineers and skilled craftsmen you see here, working under these controlled conditions, are the big reason why we've been able to mass produce (and therefore price competitively) gyros of unsurpassed excellence for use in our own systems and to sell to other manufacturers.

Honeywell's gyro line includes Vertical Gyros, Cageable Vertical Gyros, damped and undamped Rate Gyros and the highly sensitive, yet rugged line of Hermetic Integrating Gyros.

The Honeywell gyro "family" is an important part of our complete line of controls for everything that flies. We're continually working to improve it because automatic control is important to aviation's progress. And *automatic control* is Honeywell's business.

MINNEAPOLIS
Honeywell

Aeronautical Controls

2600 Ridgway Road, Minneapolis 13, Minn.

There's a limited upturn in Air Force spending. Stepped-up B-52 program, increase in North American F-100 production are first indications. These items will take about $500 million of the $1.25 billion saved by AF when it cut 965 planes and an undisclosed number of engines out of procurement plans. Other $750 million saved will also be spent.

Further cutbacks are improbable. Russia's H-bomb progress is influencing decisions. Joint Chiefs of Staff's "hard look" at defense set-up is expected to result in call for more new and modern planes than are in 120-wing "interim" goal.

AF leaders, incidentally, think AF build-up will reach 114 wings by end of present fiscal year; some even say 120 wings.

•

Aircraft industry employment apparently is at its peak. Total reached 731,600 in June, latest month available. It will probably remain at this level for next 18 months.

Industry's inventory, according to recent Census Bureau report, reached $2.3 billion at end of last year—$2.2 billion in material, supplies and work in progress, $114 million in finished products. This was highest inventory figure in U. S.

•

Entrance of Lockheed Aircraft Corp. into military atomic plane program (presumably for a bomber) probably indicates that considerable progress has been made in atomic engine development.

Airframe part of program, which threatened to influence engine design criteria, was slowed down several months ago. Now, however, Lockheed has joined Boeing and Convair on airframes, while Pratt & Whitney and General Electric continue on engines.

CAA's fiscal 1955 budget is being trimmed by Robert B. Murray, Jr., Under Secretary of Commerce for Transportation. Murray's strict news blackout order to CAA on budget matters kept exact cut unknown, but it's said to be about 15%. This would mean $110 million for fiscal 1955, against $138 million in present year.

Commerce Department reportedly will tell CAA where to cut—CAA will have little leeway to apply reductions where it thinks they can best be made.

•

Redraft of Air Force leases on its C-54's is causing concern among operators.

AF may jump the price from $4,000 to over $12,000 per month.

As long as planes are used in Korean airlift, AF will probably waive the entire lease price. However, airlift is phasing out; operators will have to look for other markets. Use of leased planes on contract military movements or commercial flights wouldn't be widespread with $12,000 per month lease.

Probable phase-out of Korean lift will further depress already-softening price of DC-4's. Operators may return some leased planes to Air Force, which has little or no money to operate them. Sale by AF would have definite effect on market.

A DC-4 sold recently for almost 50% under the $750,000 that this type aircraft was bringing a few months ago. Dip in DC-4 price would also affect DC-3, enabling some operators to switch to larger equipment.

The Washington View

Task Forces and Spare Parts

Military aircraft and parts suppliers are soon to come under a close but apparently friendly scrutiny by the Senate Armed Services Committee. How many investigations there will be, or in what form, has not been determined. A proposed program is still only in the outline stage. Planning has been generally deterred by the recent and decidedly improved record of the aircraft industry. There is, however, a salient factor that overshadows the latter. Although the desire is not to unsettle or interfere with a cleaned-up industry, political considerations must be taken into account. Revelation of any irregularities that occurred during the Truman administration would be of material benefit to the Republicans in the 1954 general elections. Indeed, it would focus attention on the two principal committee members who must seek re-election next year: Sens. Leverett Saltonstall (R., Mass.), chairman, and Styles Bridges (R., N. H.), ranking majority member.

Senator Saltonstall will have the final say on an ultimate program of investigation. He is in a particularly powerful position, operating in the dual role of committee chairman and head of the preparedness "watch-dog" group. His plan has not been to appoint a preparedness subcommittee as such but, instead to have the entire 15-member parent committee constitute the investigating group.

This way Saltonstall can hand out specific assignments and apportion the work to what he calls "task forces." Assistance to these working groups is provided by members of the permanent investigating staff, which is headed by Fred B. Rhodes. It is at Saltonstall's request and direction that Sen. Ralph Flanders (R., Vt.) will embark on a fact-finding tour of U. S. aircraft production facilities for two weeks in mid-November.

First task force set up this year by Chairman Saltonstall for the Senate Preparedness Investigating program was an aircraft procurement unit composed of Sens. Styles Bridges, as chairman, Flanders, James Duff (R., Pa.), Harry Byrd (D., Va.) and Stuart Symington (D., Mo.). With a green light from Saltonstall, the group undertook a probe of an Air Force contract with Kaiser-Frazer as a second source producer of the C119. Their work came to a complete standstill when the AF cancelled K-F's contract. They have been without a new program ever since.

Senator Bridges, for some time now, has been entreating his colleagues to assist him in getting additional inquiries going. His efforts have been bent on locating new fields of endeavor. Most recently, Bridges wrote to each of the other four members soliciting their opinions on the group's next course of action. He even suggested three possible fields of inquiry: (1) off-shore procurement; (2) aircraft engine procurement; and (3) the Air Force spares and spare parts program. Once a program is formulated, it will still be necessary, however, to get Saltonstall's approval.

Symington's Concern

Former Air Secretary Stuart Symington is one of only two senators who have so far replied to Senator Bridges' proposal to step up work of the Aircraft Procurement subcommittee. Indications are that Symington listed his first choice for a probe as off-shore procurement and as next best, engines. He was not interested in reviewing the Air Force spares story.

The strategic aspects of off-shore plane buying are what appear to concern Symington most. He is also afraid that we're providing money to buy obsolete equipment. Only last spring, on the Senate floor, the Missouri Democrat charged it was utterly fantastic to order Italian production of the F-86K. He questioned the advisability of such a move on security grounds. Nevertheless, Fiat at Turin, Italy, was given an initial order for 50 of the planes, which will be turned over as a U. S. contribution to the NATO forces.

Cheaper by the Dozen

While the 83d Congress is setting a pace that will mark it as the "investigatingest" Congress, it is beginning to look as if the Civil Aeronautics Board is to become one of the agencies most investigated. No less than five investigations are currently aimed at CAB and there may be more to come. Those under way include the following:

• **Senate Foreign and Interstate Commerce** subcommittee on civil aviation, headed by Sen. John Sherman Cooper (R., Ky.), proposes to review and critically appraise the Board's administration of the Civil Aeronautics Act.

• **President Eisenhower** has ordered the Air Coordinating Committee to undertake a comprehensive review of government aviation policy.

• **Sen. Joseph McCarthy** (R., Wis.), has initiated a preliminary probe of CAB through the Senate Government Operations Permanent Investigating subcommittee which he heads.

• **Commerce Under Secretary for Transportation** Robert B. Murray, Jr., has his office working on a number of intensive studies of subjects which are normally handled by the Board.

• **The new Hoover Commission** for an improved and more efficient government will have a task force delving into the operations of independent agencies, including CAB.

. . . Preble Staver

F-86 D Sabre Jet

All-Weather Interceptor

FIRST
- ...in speed—over 700 M.P.H.
- ...in all rocket armament
- ...in production
- ...with latest electronic flight and rocket firing controls
- ...one-man interceptor. No second crew man needed... more defense for your dollar

NORTH AMERICAN AVIATION, INC.

Builders of the F-100 Super Sabre ★ T-28 Trainer ★ FJ-2 Fury ★ AJ-2 Savage

North American Aviation has built more airplanes than any other company in the world

World's Largest Aviation Publishers

American Aviation

SERVING THE INDUSTRY SINCE 1937
1025 Vermont Ave. N.W., Washington, D. C.

• • •

Editor and Publisher
Wayne W. Parrish

Executive Editor
Eric Bramley

Phone: Sterling 3-5400 Cable: AMERAV

Managing Editor
William D. Perreault

JOSEPH S. MURPHY ..... *Technical Editor*
WILLIAM V. HENZEY ..... *Transport Editor*
ROBERT M. LOEBELSON .. *Manufacturing Editor*
PREBLE STAVER ..... *Legislative Editor*
WALTER A. KILRAIN .. *Copy & Production Editor*
KEITH SAUNDERS ..... *News Analyst*
ANTHONY VANDYK ..... *Internat'l Editor*
HARRY S. BAER, JR. ..... *Military Editor*
FRED S. HUNTER ..... *West Coast Editor*
LOIS C. PHILMUS .... *Corporation Aircraft Ed.*
WALLACE I. LONGSTRETH ... *Rates and Tariffs*
DORIS ROWZEE ..... *Airline Statistics*
JEAN-MARIE RICHE ..... *Paris Editor*
ROY PEARL ..... *London Editor*

PHILIP A. FITZSIMONS ..... *Director of Research*

October 12, 1953 **Vol. 17, No. 10**

Dassault: For France & NATO .. 20
Aviation's 10 Milestones 24
Operating Base Pays Off 31
Structural Problems Multiply ... 38
Details on Crash Fires 42
Ignoring Limits Can Be Fatal ... 54
New Flight Sensing System 63
Air Freight Struggle Continues .. 74

THIS MADE NEWS: Second source for B-52 named; greater defense spending foreseen; Fairchild to build Kaiser C-119's; McCarthy considering investigation of CAB; Convair sale investigated by Board, p. 15 . . . ACC to weigh nation's aviation policy on President's orders . . . Helio Courier gets type certificate . . . Helicopter turboprop development ordered by BuAer; C-W to supply J65 jet engines for Canberra; G-E B-29 flies on power of J73 with all props feathered, p. 16 . . . Airworthiness review discusses 'copter rules; Second Wayne Parrish scholarship announced, p. 19 . . . Inquiry considers VFR traffic control, p. 20.

AMONG THE DEPARTMENTS: Letters, p. 6 . . . Editorial, p. 8 . . . Industry Spotlight, p. 11 . . . News Briefs, p. 21 . . . Military Commentary, p. 50 . . . West Coast Talk, p. 56 . . . Production Lines, p. 57 . . . Maintenance Bulletin Board, p. 60 . . . New Products, p. 67 . . . Airline Commentary, p. 75 . . . People, p. 76 . . . CAB News, p. 78 . . . International Aviation, p. 80 . . . Bulletin Board (classified advertising), p. 84 . . . Advertisers' Index, p. 85 . . . En Route, p. 86.

General Manager: Leonard Eiserer
Director of Advertising: Stephen R. Kent
Circulation Promotion Mgr.: Larry Brettner

American Aviation is published every other Monday by American Aviation Publications, Inc., Washington, D. C. Printed at the Telegraph Press, Harrisburg, Pa. Subscription rates for United States, Canada, Mexico, Central and South American countries—$5.00 for 1 year; $8.00 for 2 years. All other countries—$7.00 for 1 year; $12.00 for 2 years. Entered as Second-Class matter in Washington, D. C., and Harrisburg, Pa.

Change of Address: Send old address (exactly as it appears on mailing label of your copy of magazine) and new address, including zone number, if any, to 1025 Vermont N. W., Washington, D. C. Allow two weeks for change-over.

Publishing Corporation: American Aviation Publications, Inc., Wayne W. Parrish, president; Leonard Eiserer, vice-president and general manager; Albert H. Stackpole, Eric Bramley, vice presidents; E. J. Stackpole, Jr., secretary-treasurer.

American Aviation incorporates Airports and Air Carriers, Airports, Aviation Equipment, The American Pilot, Aviation Sales and Service, U. S. Aviation and American Airports. All rights to these names are reserved.

ADVERTISING OFFICES . . .

New York Office: Administration Building, LaGuardia Airport, New York, N. Y. Illinois 7-4100, Stephen R. Kent, director of advertising; A. B. Copeland, regional advertising manager.

West Coast Office: Park Central Building, 412 West Sixth St., Los Angeles 14, Calif. Trinity 7997. Fred S. Hunter, manager.

Chicago Office: 139 North Clark St., Chicago 2, Ill. Central 6-5804, Bruce L. McGregor, regional advertising manager.

Foreign Advertising Representative: United Kingdom—Pearl Cooper, Ltd., 2-3 Norfolk St., Strand, London, W. C. 2. Tel. Temple Bar 8111/2.

OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory; twice yearly listing of products, people and organizations. $7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. $13.50 per year in USA and countries belonging to Pan American Postal Union, including Spain and the Philippines. $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. $150 per year. Managing Editor: Wallace I. Longstreth.

Where & When

Oct. 10-17—5th Annual All-Texas Air Tour. Information from Texas Aeronautics Commission, Walton Bldg., Austin.

Oct. 13-15—Air Transport Association, Annual Engineering & Maintenance Conf. Saxony Hotel, Miami Beach, Fla.

Oct. 14-15—New York State Dept. of Commerce, Annual Airport Development & Operation Conference, Onondaga Hotel, Syracuse.

Oct. 14-16—AIEE, 6th Annual Special Conf. on Machine Tools, Hotel Cleveland, Cleveland, O.

Oct. 15-16—Aircraft Electrical Society, 10th Annual Display Mtg., Pan-Pacific Auditorium, Los Angeles.

Oct. 18—Los Angeles Air Fair, International Airport.

Oct. 19-22—ATA, Purchasing Committee, Saxony Hotel, Miami Beach, Fla.

Oct. 22-23—Radio Technical Commission for Aeronautics, Fall Assembly, Sheraton Park Hotel, Washington, D. C.

Oct. 23-24—4th Annual Noise Abatement Symposium, Armour Research Foundation of Illinois Inst. of Technology.

Oct. 28-30—Southeastern Airport Managers Association, Annual Convention, Marlin Beach Hotel, Fort Lauderdale, Fla.

Oct. 29-30—National Business Aircraft Assn. (formerly CAOA), 6th Annual Forum & Meeting, Park Plaza Hotel, St. Louis, Mo.

Nov. 3-4—Transport Aircraft Hydraulic Conference, sponsored by Vickers, Inc., Park Sheraton Hotel, Detroit, Mich.

Nov. 3-6—National Association of State Aviation Officials, Annual Meeting, Edgewater Gulf Hotel, Edgewater Park, Miss.

Nov. 3-29—American University, 7th Air Transportation Institute, Washington, D. C.

Nov. 5-6—SAE, Fuels & Lubricants Meeting, Conrad Hilton Hotel, Chicago.

Nov. 16-17—American Society for Quality Control, Aircraft Quality Control Conf., Biltmore Hotel, Dayton, O.

Nov. 17-20—Aviation Distributors & Manufacturers Assn., Annual Convention, Broadview Hotel, Wichita, Kansas.

Nov. 19—National Air Taxi Conference, Annual Meeting, Broadview Hotel, Wichita, Kans.

Nov. 19-21—National Aviation Trades Assn., Annual Convention, Broadview Hotel, Wichita, Kans.

Dec. 1-2—Frequency Responses Symposium sponsored by the American Society of Mechanical Engineers, Hotel Statler, New York City.

Dec. 3-5—7th annual Arizona Aviation Conference, Yuma, Ariz.

Dec. 17—17th Wright Brothers Lecture (sponsored by IAS), U. S. Chamber of Commerce Auditorium, Washington, D. C.

Dec. 17—Wright Brothers Memorial Dinner, sponsored by Aero Club of Washington, Statler Hotel, Washington, D. C.

INTERNATIONAL

Nov. 1-22—IATA, Traffic Conferences, Honolulu.

Nov. 17—ICAO, African-Indian Ocean Regional Air Navigation 2nd Meeting, Santa Cruz, de Tenerife, Canary Islands.

UP THERE WITH THE BIG NAMES

Flies With SKYDROL

KLM Royal Dutch Airlines is an experienced user of Skydrol, Monsanto's fire-resistant hydraulic fluid.

Skydrol is now specified by 18 major air lines. Here are the reasons for this wide and growing acceptance:

THIS BOOK contains complete specifications and technical data on Skydrol. For your copy, write: Monsanto Chemical Company, Organic Chemicals Division, 800 North Twelfth Blvd., St. Louis 1, Mo. Skydrol: Reg. U. S. Pat. Off.

• **Skydrol** is fire-resistant . . . the *only* such fluid which can be used in most hydraulic applications on your airplane.

• **Skydrol** has double the lubricity of conventional hydraulic fluids. Two million hours of service bear out this fact.

• **Skydrol** extends the service life of hydraulic components, cuts maintenance costs.

• **Skydrol** is nontoxic . . . noncorrosive . . . stable at required operating temperatures and pressures.

MONSANTO
CHEMICALS—PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Letters

Letters should be addressed to The Editor, American Aviation Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

CASE FOR ITALY'S F-86

To the Editor:

I have read with great interest the article "Will the Italian F-86 be Obsolete?", appearing on page 28 in your September 14 issue and, as an Italian and an airman, I sincerely appreciated your honest effort to report on a subject which is so fundamentally important for the Italian aeronautical industry and consequently for the Italian Air Force.

In the interest of accuracy—which has always been the highest merit of your magazine—there are three points in the above mentioned article deserving, in my opinion, further consideration to avoid misinterpretation by your readers.

FIRST: I don't think I need to point out the inaccuracy of the statement that FIAT's F-86K is ". . . relatively inferior . . ." to the F-86D and therefore ". . . obsolete and unsatisfactory. . . ."

As a matter of fact the September 9 issue of your *American Aviation Daily* contains an official statement of the U. S. Air Force that ". . . the Italian F-86K will have a different armament system and will lack some of the highest classified gear, but in the other respects it will be a counterpart of the F-86D and may be even superior. . . ."

SECOND: I would like to comment on the mild criticism made by your reporter on the fact that the F-86K order didn't follow the patterns of similar orders for NATO off-shore procurement.

This is perfectly true, but in my opinion the F-86K program is the soundest of them all, and is an example of a perfect cooperation between the American and Italian aeronautical industries and the U. S. and Italian Air Forces within the NATO framework.

Very little attention has been paid in the USA so far to the fact that, following a wise policy issued by General Aldo Urbani, Italian Air Force Chief of Staff, the Italian aeronautical industry is, for the time being, setting aside an impressive long standing tradition of ingenuity in prototype design and development, which resulted in the first formation Atlantic crossing, exactly 20 years ago, and in the first jet plane flight in 1938, among many other "firsts."

The sacrifice in national and industrial pride that other European nations didn't have the courage or the possibilities to face, has been made for the sole purpose of avoiding the great expenses involved in the development of new prototypes.

In other words, it is the opinion of the Italian authorities that in consideration of the urgent need for all-weather fighters for NATO defense, the best policy for the time being is to give the Italian and U. S. taxpayers the best returns by concentrating on a production program which will give immediate and positive results.

It is in this spirit that the F-86K project was born. It brings about a very interesting case of cooperation between two industries and two Governments to aid in manufacturing an airplane on an economic-military basis that opens the door to future peacetime cooperation on a strictly industrial basis.

The main objective of this cooperation is to have an European source of production of the complete F-86K. Naturally the 100% manufacture in Italy of the plane is not believed practical because, for certain items, economical factors must be taken into consideration.

These economic criteria will be adhered to by the two Governments in deciding, in certain cases, whether to take advantage of the cheaper Italian labor or of the cheaper American mass production machine facilities.

On the whole the F-86K program has the following economic, political, and military advantages:

- **It would avoid complete deterioration** of the Italian aeronautical industry, which is unable to sustain production in this temporary period of emergency, when the Italian Air Force is spending most of its budget to bring its facilities, equipment and crews up to date and has only very limited funds available for aircraft procurement. There is no doubt that an Italian aeronautical industry, producing modern airplanes on a sound economical basis, is to be considered a valuable asset in NATO build-up of the Western Defense.

- **It would result in a maximum** military-economic return for the money invested by American and Italian taxpayers in aircraft production.

- **In the unfortunate event of a "blitz"** atomic attack by the enemy on the aeronautical industries of Western Europe, even with the result of substantial destruction of the manufacturing facilities, the Italian industry would be in a much better position than the other European industries to contribute to the NATO effort with a pool of workers already skilled in American standards, ready to be employed by the Allied powers or rapidly to resume work in Italy with the aid of tools and material supplied by the U. S.

The same applies to the pilots and crews of the Italian Air Force, who will be immediately available to fly American planes, being already trained to fly the Italian-built U. S. type of aircraft.

- **In the even more unfortunate event** of military occupation of the North European aircraft plants by an advancing enemy, it would be much easier for him to force the production of a locally designed type of plane with complete local supply of accessories, hardware and machined parts, than to start building the F-86K of which several items such as forgings, extrusions and accessories would be absolutely unavailable, due to the fact that the U.S.A. would be the only source of supply.

THIRD: It is not fair to say that Italy ". . . is not scheduled to supply any funds for F-86K production. . . ." On the contrary, the Italian Government, after having purchased the F-86K license, has repeatedly and officially stated that it will support the program with the procurement, in addition to the USAF orders, of as many F-86K's as may be purchased within its budgetary possibilities. There is no doubt that these orders by the Italian Government will be placed very soon.

ENRICO PANE

Italian Embassy
Washington, D. C.

•

KNUCKLE RAPPING

To the Editor:

A rap on the knuckles to Cy Caldwell and to AMERICAN AVIATION for the article in the Sept. 14 issue, "Air Force Pilots Whacked by Economy Axe." As a regular reader of your magazine, as well as the *Daily*, I am always impressed by the well written articles and the coverage given the complex aviation picture.

The subject of the article is noteworthy and Mr. Caldwell has a number of good points, but they are so camouflaged by a lot of irrelevant material that the whole thing left me with the impression of a very poor example of "high-school" journalism. Mr. Caldwell seems to be trying to imitate the style of Mr. Parrish, with very little success, as is usually the case with imitations.

- **Item:** Two references to the furnishings of the office. Overdoing it, don't you think?

- **Item:** The short lesson in Civil War history is a bit far-fetched and confuses the issue.

- **Item:** "Muted" squawk boxes and funeral telephone bells. Oh, Brother!

I realize that, at times, pure fact can be very dull but please don't turn an otherwise excellent trade magazine into an outlet for the "run-the-gamut-of-the-emotions" school of writing.

C. E. BROWN

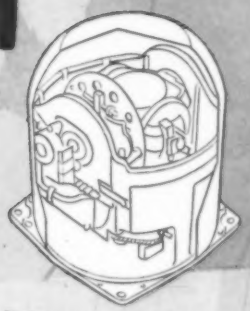
76 Union Avenue, Apt. F-1
Irvington 11, N. J.

(Note by WWP: Grateful as I am for Reader Brown's pat about my own writing, I must in all humility point out to him that Cy Caldwell was a world renowned aviation writer even before AMERICAN AVIATION was founded in 1937. Not only that but Cy Caldwell is a recognized authority on all phases of military air power. He developed his own distinctive style of writing—of which I have long been an admirer—long before I got the hang of putting words and phrases together.)

pushing precision toward perfection

Eclipse-Pioneer's "Polar Path" system guided the first commercial over-the-Pole flight* with such accuracy that the log of the now-famous Scandinavian Airlines System's flight carried the notation "works to a miracle". How was it possible to produce this gyro that actually proved to have less than 1° random drift? Admittedly, it was a special gyro, but the answer nevertheless lies in advanced production techniques and facilities that are pushing gyroscope precision toward perfection. Today, *even machining* of gyro parts is being accomplished at E-P in a specially constructed, atmosphere-controlled room where castings "soak" for 36 hours to assure stability of carefully machined tolerances—where electronic air cleaners snatch up foreign particles so fatal to delicate mechanisms—where specially constructed machines automatically hold split-hair tolerances as a matter of routine and surface finishes are maintained to the incredible limits of the thickness of a single light band. In the entire industry, only Eclipse-Pioneer can offer precision mass-production facilities like these—facilities that literally are pushing gyro precision toward perfection.

*NOVEMBER 20, 1952



PRECISION PRODUCTS* MADE BY ECLIPSE-PIONEER

- Automatic Pilot and Flight Path Control Equipment
- Airplane and Engine Instruments
- Flight and Navigation Instruments
- Power Supply Equipment
- Air Pressurization and Ice Elimination Equipment
- Engine Starting Equipment
- Oxygen Equipment
- Precision Components for Servo-mechanism and Computing Equipment
- Sand, Permanent Mold and Die Castings of Magnesium and Aluminum
- Plaster Mold Castings

Manufacturing capacity is now available for a great many models of these products.

Eclipse-Pioneer

TETERBORO, NEW JERSEY · DIVISION OF Bendix AVIATION CORPORATION

Export Sales: Bendix International Division
72 Fifth Avenue, New York 11, N. Y.

World's Largest Producer of Aviation Instruments and Accessories

Editorial

Indian Summer in Washington

INDIAN SUMMER arrived late in Washington this year. The trees have now begun to turn into reds and yellows. The warm, dry air heralds the hastened pace of politics and government activity and capital intrigue. Cocktail parties are in full swing. And in the schools the children face our flag and repeat in unison:

"I pledge allegiance to my flag and to the Republic for which it stands; one nation indivisible, with liberty and justice for all."

The Washington narcotic traffic continues. So does gambling. Teen-age gangs continue to break into cars and stores and homes. Traffic clogs the capital's handsome tree-lined avenues. Tourists have gone home. Brawls, yokings, beatings and assaults top the local news. Department store sales are off. The real estate market is down. Behind the beautiful facade of the sprawling city some of the world's worst slums continue to exist. But it is fall in Washington and heads are held high and people walk more briskly and the city's sores are covered up and not discussed in polite society.

by W. W. P.

In the vast gangling government, vacations are over. This is the time of the year when reports and budgets and proposals are completed and submitted. Congress is away but investigating committees are active. Rumors of more layoffs continue but it is now clear that the new administration intends no real house cleaning. The Democrats, many of whom remain ideologically attached to the Roosevelt-Truman days, continue to run much of the government. It is so easy to lie and profess false allegiance in government; the top echelons come and go so rapidly anyway. But the homosexual influence which exercised an incredible power and direction in American foreign policy in recent years has lessened substantially and is replaced—with a more firm, natural outlook.

"I pledge allegiance to my flag and to the Republic for which it stands . . . "

THE left wing intellectuals and columnists who vent their anger at McCarthy continue strangely silent about Communist espionage, Communist influence and Communist infiltration. Is it *really* known or appreciated how many secrets have been passed over to the U.S.S.R? And if you are a native born Republican your chances of landing a good spot in the government are still less than even. But it is Indian Summer in Washington and the people out around the country, all the people, are so trusting. It is so much easier just to be pleasant to everybody. Why stir up a fuss—and get persecuted and blacklisted from the cocktail circuit?

This is the time when the influence boys recheck and re-evaluate their sources. Secretaries must be planted in the right top offices to leak out vital information. Vice presidencies must be held open for those newcomers to top Washington positions who use government as a stepping stone and whose decisions can be had in exchange for soft corporate posts or other considerations. Or for paying unpaid bills back home. This is the time to double check to make sure the men on the string keep in line; there is nothing so satisfying to the influence boys as men in government who can be counted on through hell and high water not to waver on a particular cause or case.

" . . . with liberty and justice for all."

But even the warm fall sunshine must not relax the need for caution. Some top Eisenhower appointees are strange indeed. They can't be bought; they have an odd sense of public morality. They must be passed by, or over, or handled with utmost care. But there are others who are naive to the intrigues of Washington; their wives present golden opportunities. Socialize. Flatter. Put on the dog. Everybody wants to meet bigwigs. Not in public, of course, but in the right homes. Right connections. Stepping stones. Something better ahead. Do right by the right people and they're made. Or so they think. It *has* been done. Oneself and one's meal tickets come first. The flag can take care of itself; it's lived through an awful lot already. After all, who will know 50 years from now?

Indian Summer is here again and so are all of the multitude of good things and the bad things which make up the complex of a large capital in a large country where allegiances are sometimes kept on a point of moral honor and patriotism, and are sometimes shamefully forgotten on a point of selfish personal interest. Ambition and power can sometimes be frightening things.

AND SO AVIATION in its small niche in the capital senses the annual reawakening which comes with Indian Summer. First class mail by air is getting its historic start. The Civil Aeronautics Board continues to plug away in a vacuum, deciding each case depending upon the weight of pressures and ignoring the broad economic aspects and perspectives and making most decisions on who-knows-who and who-is-attached-indelibly-to-what and quite rarely on the plain ordinary facts by which one determines abstractly what is right for the flag and for the Republic for which it stands and one wonders what the oath of allegiance really means when it can be forgotten so expediently on occasions. Integrity is a jewel apparently beyond the reach of the weak.

Even the fine fall weather cannot overcome acute cases of jitters, and the CAB has more than its

Safe-sealed pump aids flight of the

BOEING STRATOFREIGHTER

RG-9540 HEATER FUEL PUMP—6/100 hp electric motor driven, weight less than 4 lbs., rated capacity 35 gph at 25 psi discharge. Several hundred of these pumps have been manufactured for Boeing.

Big planes like the Boeing C-97 Stratofreighter may use as many as four or five combustion heaters for de-icing. Extra pressure to force high octane fuel to these heaters is furnished by the Lear-Romec Heater Fuel Pump illustrated.

Designed to operate at temperatures as high as 180° F, and as low as –65° F, it must deliver an unfailing supply of fuel to heaters for de-icing—without incurring fire hazard.

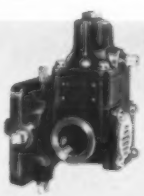
Triple assurance against fire hazard is provided by a primary seal between motor and pump, a seal leakage chamber and a secondary seal between chamber and motor. The latter, a new feature, eliminates the leakage of fuel from pump into the motor.

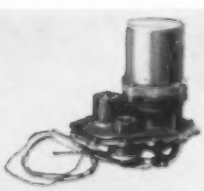
Included in the comprehensive line of aircraft fluid systems and oilless pressurizing equipment produced by Lear-Romec are many new and novel products. For detailed information write for the latest Lear-Romec catalog.

LEAR-ROMEC *Division*
Abbe Road, Elyria, Ohio
Grand Rapids Division, Grand Rapids 2, Michigan
Pacific Division, Los Angeles, California
Motor, Incorporated, Grand Rapids 2, Michigan

Advancing the Frontiers of Flight

AIR COMPRESSORS


ENGINE DRIVEN FUEL PUMPS


WATER INJECTION PUMPS

OIL TRANSFER PUMPS

OTHER LEAR-ROMEC PRODUCTS:

Air Motors • Rotary Hand Pumps • Fluid Regulator Valves • Airborne Air Compressors • Centrifugal and Turbine Pumps Camera Vacuum Pumps Pneumatic Motors • Dehydrators • Absolute Pressure Switches

share this year as it prepares to approach Congressional appropriations committees with fear and trembling as it begs, justifies, or apologizes for funds for next year's business. The word "subsidy" is awesome and terrifying indeed. And the five members, ordered by the executive branch of government to economize, forget that they are creatures of Congress and not of the executive branch. They forget that under the mandate of Congress they are to promote and develop air transportation for the nation and the public and instead are listening, weakly and quaking, to those in government who have neither power nor authority to strip down a great new transportation system.

So deceptive is Indian Summer that one would never suspect that civil aviation faces its biggest crisis in the past 15 years during these next few months when cold, dampness, and sinus trouble replace ideal World Series weather, and where are the champions of the flag who are not afraid to speak up and ask for more money, not less, so that the people may have better air service and so that America's international air transport will not vanish down the drain as did the nation's merchant fleet, simply because a few millions had to be saved at home in order to supply billions to other people around the world.

And so, too, it was not unexpected that the Under Secretary of Commerce, Mr. Robert B. Murray, Jr., should receive with all of the professed modesty and surprise required by a government official who knew all about the thing in the first place, a letter from the President requesting Mr. Murray, as chairman of the Air Coordinating Committee, to undertake a comprehensive review of U. S. aviation policy.

Possibly even in the warm glow of Indian Summer Mr. Murray didn't expect to receive from the President such an all-sweeping, all-powerful authorization. But even on the odd chance that he didn't, the aviation industry which has come to expect anything was shocked out of its collective seat. And if the industry was surprised, imagine the surprise received by the staff of the ACC itself.

MR. EISENHOWER'S letter, reported in detail in this issue, does not mention either *military* or *civil aviation*. It just mentions *aviation*. That can mean anything and everything. It is possible that the Aircraft Industries Association and the Air Transport Association will recover sufficiently from their immediate shock to realize that common sense dictates that the scope of the review must, of necessity, be largely restricted to the civil or commercial side, although there are certain overlappings with the military which will be inevitable.

A comprehensive review of aviation would be much in order, in the view of many, but there is very grave doubt at the outset that the ACC, which is comprised solely of the heads of 10 government agencies, is the competent agency to perform the clinical tests. Added to this apprehension is the doubt that Mr. Murray is the competent director needed for the review. Mr. Murray is demonstrating by speeches and lectures to visitors that he already has the answers and hardly needs an investigation to determine anything at all except as a means of putting his answers into formal conclusions.

It is heartwarming, even with the prospect of another dreary winter which history tells us inevitably follows the entrancing Indian Summer, that industry is to be *consulted* in this comprehensive review. But what of Congress? And just what does consultation mean? But dat ol debil Indian Summer has lured and trapped so many in the smoky haze which comes from the myriad leaf fires at dusk. One can conjure up an awful lot of Indians at this bewitchingly delightful time of year. There are even those who have started thinking that it's only one more year until Indian Summer rolls around again.

Orchids to NATC

Congratulations are in order to the National Air Taxi Conference. The CAB recently volunteered to eliminate a regulation which prohibited air taxi operators from using the words "Airways," "Airline," or "Airlines" in their company names. NATC has now told the CAB that it believes the restrictions should remain in force. The taxi conference says if the regulation is wiped off the books the doors would be opened for operators to adopt any name that they see fit "and to use the same in competition with the certificated airlines." This is a far-seeing and sensible action by NATC. In pure self interest the taxi operators could have taken the opposite view. The fact that they didn't is encouraging for the orderly development of the entire air transport industry.

What Price Economy?

We print herewith without comment a report sent to us by a friend on the west coast following the National Aircraft Show at Dayton over Labor Day weekend.

"As a taxpayer you may be interested in the preparations the Air Force made for the Bendix event in which five commands were represented by two planes each, or ten planes in all.

"However, because you never can tell when a jet plane won't percolate, each command sent a spare or alternate plane to Edwards AFB at Muroc for each plane entered. When each plane took off in the race two planes went down the runway. One was the regular No. 1 airplane. The other was the alternate. Under the race rules, only one plane could take off. So the alternate only went so far down the runway, then shut off when it saw the No. 1 plane was going to make it. But if the No. 1 plane faltered No. 2 would have taken off and gone on. This means twenty planes instead of ten were fixed up, manned, fueled and all set to go.

"But this ain't all. For each two alternates there was another spare. That was so there would be a full complement of planes and alternates in the event one of the planes should break down or go haywire in advance. So instead of twenty we have twenty-five planes all sent to Muroc and prepared to fly. In at least two instances these preparations included the shipping of 2500 pounds of dry ice to Muroc to ice down the tank trucks with which the planes were to be refueled.

"Each command sent its own weather people to Muroc to forecast weather. Add the special refueling crews sent out by each of the five commands to various places where maybe the planes would have to come down for fuel and you come to quite a nice total bill for the event."

. . . WAYNE W. PARRISH

Industry Spotlight

Sikorsky's recently announced S-56 transport helicopter, designated the XHR2S by the Marine Corps, reportedly will feature hydraulic steering for ground handling in the production version. Hydraulics are used for retraction of the landing gear of the S-56, first helicopter to feature a retractable gear.

•

A Boeing WB-29 Superfort, operated by the USAF Air Weather Service 57th Strategic Reconnaissance squadron, flew a total of 366 hours and 20 minutes in one month recently. Maintenance time required for the period amounted to 3082 man-hours, or 6 hours and 57 minutes per flying hour. Three major inspections and one engine change were included in these maintenance times.

•

Curtiss-Wright's version of the Bristol Olympus has a potential of over 20,000 pounds thrust if the Bristol experience with the parent engine is any indication. Bristol claims advanced versions of today's Olympus will have 15,000 pounds thrust, compared with about 10,000 pounds for today's engine and 20,000 pounds for future members of the twin-spool Olympus family.

•

Pratt & Whitney has refuted any connection with Super 92 conversions executed by Remmert-Werner, Inc. P&W claims that the R-1830 cannot be "hot rodded" to pull 700 horsepower for any length of time without endangering the life of the engine. On the other hand, executive DC-3 operators report favorable experience with the conversion to date and prefer its approximate $15,000 price tag to the alternate choice of using the P&W R-2000 costing $36,000. The Super 92 is said to produce a 15-20 mph increase in cruise speed (AMERICAN AVIATION, **April 13).**

•

AiResearch Manufacturing Company, which is producing over 850 different models of components for aircraft and missiles, reports that it costs approximately $30,000 to $40,000 to develop a hot air valve designed to operate at temperatures of around 1000° Fahrenheit and that cost of developing a cooling turbine runs over $100,000.

•

Long overdue clearing of the air surrounding military support of civil distance measuring equipment can be expected soon. A special CAA military committee formed to study the issue has already made its report; final decision will come from Commerce and Defense secretaries Weeks and Wilson. Civil interests were not consulted in the study, making it evident that a decision which displeases civil airways users will cause further antagonism.

•

Airline experience with simulators and duplicators should get a big boost later this year as Curtiss-Wright starts deliveries on a group of these training aids to United Air Lines, Eastern, and Trans World Airlines. UAL's simulators for the Convair 340's are scheduled for year-end delivery shortly after the DC-6B simulators. Eastern will get four of its seven duplicators in January, and TWA is scheduled to get the first of its 14 duplicators on an early schedule. TWA doubled its earlier order for seven duplicators.

•

INDUSTRY MISCELLANY

Although Westinghouse has no immediate plans for building the **Rolls-Royce Avon under license,** it is importing a few of the engines for testing . . . USAF has awarded two contracts for **C-47 overhaul,** totaling $2.5-$3 million dollars, to Southern California Aircraft Corp. at Ontario International Airport . . . Temco Aircraft Corp. of Dallas has been awarded an $800,000 contract for **major overhaul of 40 Lockheed R7V Constellations** . . . Dr. David G. C. Luck of RCA Laboratories will receive the **Stuart Ballantine Medal** of The Franklin Institute "For his invention of the Omnidirectional Radio Range, an essential element in present day air traffic control."

★

Opportunities in ELECTRONICS

★

Top-notch men of integrity are invited to write regarding opportunities that exist in our long range B-47 stratojet modification program. Maybe we've got what you are looking for ...a happy combination of working conditions with full employee benefits, high salary levels with unsurpassed living and recreational facilities. You'll enjoy life in the friendly city of Tucson. Write today for information.

MAIL COUPON TODAY

GRAND CENTRAL AIRCRAFT CO.

GLENDALE, CALIFORNIA
TUCSON, ARIZONA

Personnel Manager,
Grand Central Aircraft Co.,
P.O. Box 5072, Tucson, Arizona

name

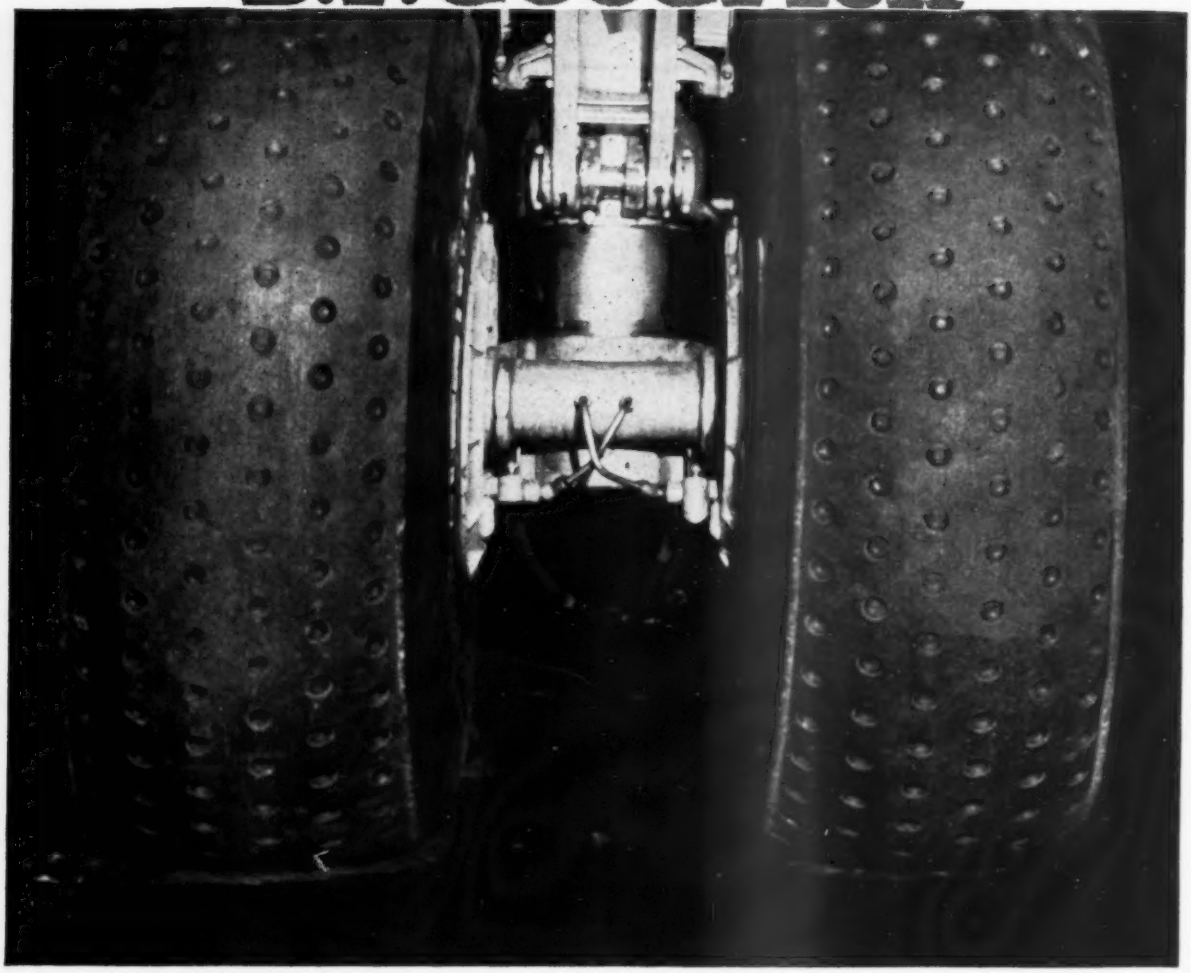
address

city and state

I am qualified in the category checked below, and wish further information.

☐ AERONAUTICAL ENGINEER
☐ ELECTRONIC ENGINEER
☐ ELECTRONIC TECHNICIAN

B.F.Goodrich



New B.F.Goodrich tire gives up to 27% more landings

RESULTS are now coming in from still another airline testing the B. F. Goodrich dimpled tire versus standard airplane tires of other makes. They indicate the new BFG tire gives up to 27% more landings per tire.

The B. F. Goodrich dimpled tire combines a new tread with other changes to give a longer-wearing tread and a tire that gives a higher percentage of recaps. The dimpled tread provides better distribution of the tire load and reduces exposure to tread cutting. The longer-lasting cord construction cuts down separation to make for more and easier retreading.

On the basis of its test showing, Pan-American Airways is adopting the dimpled tire as standard equipment. Twenty-three other airlines have also standardized on the B. F. Goodrich dimpled tire—many, like Pan-American, as a result of their own test programs. They include: American, Braniff, Capital, Central, Continental, Empire, Frontier, Hawaiian, Lake Central, National, Northeast, Northwest, Philippine, Pioneer, Southern, Southwest, Trans-Texas, United and West Coast.

B. F. Goodrich is now producing the new dimpled tire in seven airline sizes. Like the recently announced Tubeless Tire for combat jets, it's another first in aviation tires from B. F. Goodrich, leader in rubber research and engineering.

Send this coupon if you would like more information about BFG tires or other aeronautical products. Check the items; print your name and address in the margin below (or pin to your company letterhead).

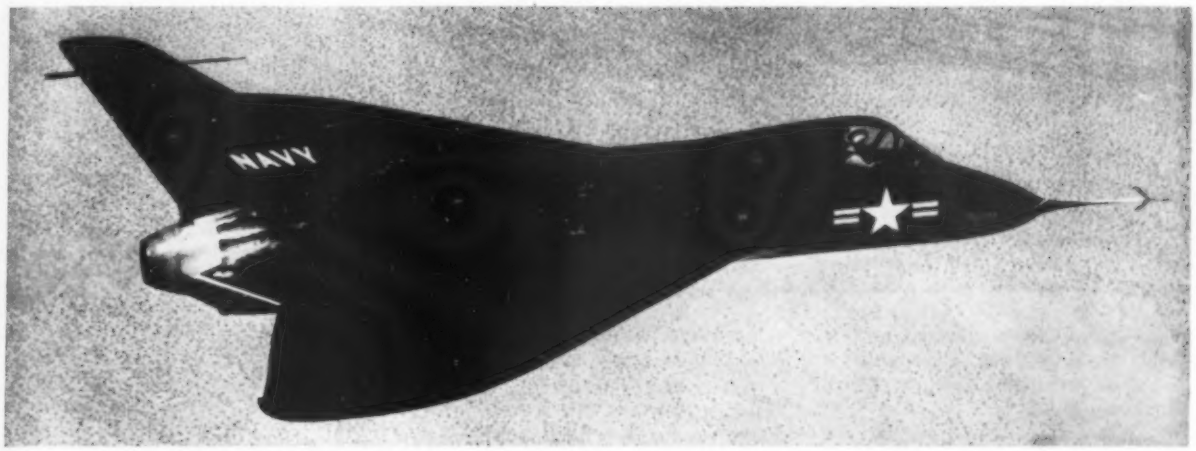
- ☐ Tires
- ☐ Wheels and Brakes
- ☐ De-Icers
- ☐ Heated Rubber
- ☐ Avtrim
- ☐ Plastilock Adhesives
- ☐ Pressure Sealing Zippers
- ☐ Canopy Seals
- ☐ Rivnuts
- ☐ Hose and other accessories
- ☐ Please have representative call

Mail to The B. F. Goodrich Co., Dept. A-74, Akron, Ohio

ESTABLISHED JUNE 1, 1937

American Aviation

VOLUME 17, NO. 10



NEW RECORD-HOLDER is the Navy's XF4D, which set a mark of 753.4 mph as this issue went to press.

New Planes Spark Latest Speed Attempts

Three-way rivalries add interest to series of rapid-fire attempts to run off with world speed records.

By Robert M. Loebelson

INTERNATIONAL, interservice, and intercompany prestige were at stake early this month as four new military fighter planes, two American and two British, prepared to make new attempts at the official world speed record.

The U. S. interceptors—the Navy's XF4D Douglas Skyray and the USAF's F-100 North American Super Sabre—were both at Salton Sea, Calif., where the temperatures were ideal for speed runs.

Britain's Vickers Supermarine Swift F4 was at Azizio Plain in Africa's Libyan desert, and the Hawker Hunter F1, which set a mark of 727.6 miles per hour during last month's Farnborough show (already surpassed twice), was still in England, but there were rumors it would be shipped to the California desert to make a new try there.

In a sense, however, the four men piloting the latest jets on both sides of the Atlantic were engaged in a fruitless struggle, for each could only hope to come within about 500 mph of the unofficial mark, set by Douglas test pilot Bill Bridgeman in the rocket-powered D-558-2 in August, 1951. Bridgeman's mark of 1238 mph has been approached only by Marine Lt. Col. Marion E. Carl, who flew the same Skyrocket at 1188 mph in August of this year.

But since the D-558-2 made its runs at high altitudes and since they were not monitored by the National Aeronautic Association (U. S. representative for the Federation Aeronautique Internationale), the flights by Bridgeman and Carl have no legitimate status as far as the FAI is concerned, and the newest fighters in various parts of the world will be streaking in the 750-800 mph speed range for the next few years —at least until the jet engines which develop 15,000 pounds of thrust or more (e.g., the de Havilland Gyron, General Electric J77 and J79, Pratt & Whitney's J75, and advanced versions of the Bristol and Curtiss-Wright Olympus) emerge from their present early stages of development.

As far as the British were concerned any of their aircraft which could succeed in regaining the title from America would enhance recognition of British planes and engines all over the world. There is no doubt that they were long overdue. On September 7, 1946, a Gloster Meteor gained the title by going 616 mph, but lost it to a Douglas D-558-1 Skystreak August 25, 1947, the Skystreak barrelling over the speed course at 651 mph. On September 15, 1948, a North American F-86A grabbed the record with a 671 mph mark which stood for more than four years. It was not until November 19, 1952 that another Sabre, an F-86D, exceeded the record with an average of 698.

Then came the rapid-fire attempts. An F-86D on July 16, 1953 set a mark of 716. The British got into the act at that point when a Hawker Hunter F1 chalked up 727.6 on September 7; by September 25 the competing Supermarine Swift F4 had upped this to 737.3 mph. Three days later an XF4D increased the average to 742.7, but this was less than one per cent margin required

Contenders For the Title

UNITED STATES:

Plane	Engine	Estimated Engine Thrust (pounds)
North American F-100 Super Sabre	Pratt & Whitney J57	10,000
Douglas XF4D Skyray	Westinghouse J40	9000
Republic F-84F Thunderstreak	Wright J65	7200
North American F-86H Sabre	General Electric J73	9000
Consolidated Vultee F-102	Pratt & Whitney J57	10,000
BRITAIN:		
Hawker Hunter Mark 1	Rolls-Royce Avon RA7	10,000
Vickers Supermarine Swift Mark 4	Rolls-Royce Avon RA7	10,000
CANADA:		
A. V. Roe CF-100 Mark 4	Avro Orenda	8500
Canadair F-86	Avro Orenda	8500
AUSTRALIA:		
Commonwealth (F-86) Sabre	Rolls-Royce Avon RA7	10,000
FRANCE:		
Dassault Mystere 4B	Rolls-Royce Avon RA7	10,000

under FAI rules and another Skyray attempt was to be made. This try was expected to be followed by F-100 and Hunter flights.

If a British plane emerges as the titleholder when the current flurry ends, it will not only help to improve sales of British military aircraft but will undoubtedly be used as a selling point for commercial planes as well. The rivalry goes even deeper, however. Both the Hunter and Swift interceptors have been ordered into "super-priority" production for the Royal Air Force. But the Hunter has also been licensed for production for the Belgian and Netherlands Air Forces and for NATO.

Vickers Supermarine, probably hurt by selection of the rival Hunter for NATO, may feel there is still time to have the Swift replace the Hunter in Belgium and Holland, or at least enough time to get the European order split. The Hawker-Siddeley Group, on the other hand, can use the Hunter's speed achievements as an answer to those who criticize it as a weapon of warfare.

Domestically the feud is currently between both the Navy and the Air Force on the one hand and Douglas and North American on the other, with Republic Aviation's F-84F as the possible last-minute entry to compete with the Skyray and Super Sabre.

The Navy held the title indirectly through Marine officer Marion Carl in the Navy's Skystreak seven years ago, but yielded to the USAF's planes and pilots when the Sabre started shattering marks. Naturally North American and the USAF would like to team up to beat out the Navy and Douglas, and all four parties would prefer to see British tenure of the speed record as short-lived as possible.

Complicating the situation even more is the probability that the jets of at least three other nations and some more from the U. S. might find themselves involved. Leading prospect at the moment is Australia, where the Commonwealth Aircraft Corp.'s CA-26 Sabre (licensed by NAA and powered by a Rolls-Royce Avon) is reportedly one of the hottest planes in existence.

Summer, with its high temperatures on the Australian desert, is not far off Down Under, and it is recognized that every 10° increase in temperature is worth an extra seven mph in speed. (It is for that reason that Hawker-Siddeley's managing director, Sir Frank Spriggs, may send the Hunter to California rather than Libya for trials. Temperatures at Salton Sea tend to run even higher than they do on the Azizio Plain.)

Other foreign contenders include Canada's two leading fighters, both powered by Avro Orendas, the Canadair Sabre and the Avro CF-100 Mark 4, in addition to the Mark 4B version of France's Avon-powered Dassault Mystere, now nearing completion. Not to be overlooked as a possibility is Russia, still a member of the FAI, even though few claims have been submitted to FAI's Paris headquarters from the Soviet Union lately. The Reds almost certainly have a fighter in the 750-mph class and could conceivably put that aircraft through FAI requirements simply as another item of interest in the Cold War.

Squabbles

Ironically the speed runs now under way have touched off minor squabbles about the way the aircraft involved are equipped and about the merits of using Mach number rather than miles per hour as the unit to be measured. The F-86 records, for example, were made with the aircraft flying as they would in combat, i.e., with machine guns or rockets, while the Hunter and Swift marks were set with such equipment eliminated.

But it is the temperature difference that has provoked most of the arguments. Hawker's chief designer, Sir Sidney Camm, has pointed out that the Hunter's record flights September 7 were achieved while the temperature was at 74° Fahrenheit. Had the temperature been 104°-105°, he said, the Hunter would have attained about 745 mph, rather than 727.6.

Camm also noted that the Hunter's first crack at the record, 726.4 mph, was made while the temperature was 72°, i.e., Mach No. attained was .944. The actual record flights, with a 74° temperature, and an average of 727.6 mph resulted in a Mach number of .943—.001 less than the unsuccessful attempt. The Swift's speed run in Libya (737.3) was made with temperatures of 104°.

• • •

Requirements For Speed Run Attempts

As set by Federation Aeronautique Internationale

- Plane must be a standard model rather than an experimental type.
- Test run must be made over an official three-kilometer (1.863 mile) course.
- Four flights (two in each direction) must be made; the average of the four determines the speed run.
- Aircraft must not exceed an altitude of 500 meters (1640 feet) after taking off and must not fly over 100 meters (328 feet) during the filming and recording by FAI officials.
- To qualify for a new mark, the plane's speed must average at least one per cent better than the previous record.

SELECTED for second source production is Boeing's B-52.

Second Source for B-52; Spending Ahead

Selection of Boeing Airplane Co.'s Wichita (Kans.) Division as a second source producer for the Boeing B-52 heavy jet bomber, coupled with an accelerated Air Force procurement program for North American F-100 fighters, has apparently signaled an AF trend toward increased spending on later model aircraft.

Both actions followed extensive cutbacks in aircraft and engines during September, as a result of which the AF realized savings of more than a billion dollars.

Whether this reversed attitude towards expenditures will continue through the next fiscal year (FY 55 budget requests are now in preparation) has not yet been determined, since recommendations by the Joint Chiefs of Staff have not been submitted. Defense Secretary Charles E. Wilson, however, commented recently that the overall Defense Department budget request will be "on the order of the 1954 request or less."

He further indicated that it might be possible to cut Defense Department spending for fiscal 1955 by some five per cent below the $43 billion estimated for the current fiscal year. Asked whether this meant a prospective spending figure of about $40 billion, Wilson said, "You are getting close."

Queried about the AF budget specifically, Wilson referred the question to AF Assistant Secretary Roger Lewis, who said, "It will be subject to the JCS review, which is now proceeding on the basis of 143 wings."

With the increased production in B-52's and F-100's the AF has earmarked approximately $500 million of the billion-plus savings in the recent cutbacks. An estimated $250 million will be required for tooling the Wichita plant for Stratofortress production, according to AF Secretary Talbott.

"Extensive tests have been so successful it has been decided that this aircraft is ready for expanded production and, to eliminate danger of a single source for this important aircraft, it is essential that the Wichita plant be tooled and put into production as soon as possible," he said.

The large jet bomber, powered by eight Pratt & Whitney J57 turbojets, is now being produced under prime contract by Boeing at Seattle, Wash. It has been announced that two such aircraft have been built. Production orders at the Seattle plant have been increased, and the west coast plant will produce B-52's at its fullest capacity. Talbott noted that monthly output of the bombers would be increased "from 25 to 40%" with the addition of a second source producer.

Fairchild to Build Kaiser C-119's

The 88 C-119's scheduled to be built by Willys Motors (Kaiser) as a Fairchild-licensed second-source producer have been ordered from Fairchild's Hagerstown plant. Kaiser's Willow Run facility, which at one time was to produce 159 C-119's and 165 Chase C-123B's, had its plane production stopped by USAF decree at the 71st Flying Boxcar. The rest of the C-119 contract has now been transferred to Fairchild.

McCarthy Considering CAB Investigation

Senator McCarthy's government operations investigation committee is considering an investigation of the Civil Aeronautics Board. Preliminary inquiries, which will determine whether a full-scale hearing will be held, have been made during the past three weeks.

The committee is issuing no official comments on what will be considered if the case gets under way. But a Washington columnist, Edward K. Nellor, wrote recently that "long-time Washington whispers of favoritism and accusations of cash changing hands as high up as the White House has interested Senate probers."

CAB Investigates NEA Convair Sale

On the apparent theory that subsidized Northeast Airlines may have been deprived of some $225,000 in profits from the sale of three Convair 340's, CAB's Enforcement Office instituted an investigation against the airline, the Atlas Corporation, Airfleets, Inc., and Consolidated Vultee Aircraft Corporation.

All four are, or were at the time of the transaction early this year, interrelated as far as ownership is concerned. The profit, about $75,000 per plane, came from the sale to Alitalia Aerolinee Italiane (the Italian airline), of the Convairs which originally were ordered by and for Northeast.

According to enforcement attorney John F. Wright's complaint, the profit was realized by Airfleets, Inc., a corporation headed by Floyd B. Odlum, who is also president of Atlas and was board chairman of Convair.

The deal went this way, according to Wright: NEA purchased the Convairs at $535,000 per plane. In February, 1953, NEA agreed to sell the planes to Airfleets, Inc., at the same price. On the same day Airfleets entered a contract with Alitalia to sell it the planes for $610,000, or $75,000 above the original price.

Wright contended that this, among other things, violated an outstanding CAB order which permitted Atlas to keep its control of Northeast for a temporary period, subject to various conditions. One of these was that any transactions between Atlas and NEA had to be first approved by CAB.

Thus, the attorney continued, Atlas has forfeited its right to further extension of the Board order and should be directed to divest itself of control of NEA.

CAB's interest also comes about this way: If the $225,000 profit went directly to NEA, the carrier's subsidy requirements might be reduced by an equivalent amount. Thus Wright urged CAB to issue a cease and desist order to the parties to prevent further such transactions. The Italian carrier, Alitalia, is not involved in the complaint.

With four props feathered, a converted B-29 flies at 180 mph on the power from a General Electric J73 engine. Newest and most powerful engine being produced by G. E., the J73 powers the North American F-86H Sabre.

ACC to Weigh National Aviation Policy

A review of U. S. aviation policy is to be undertaken by the Air Coordinating Committee for President Eisenhower's "consideration and approval." The review was ordered by the President on Sept. 23 in a letter to Robert B. Murray Jr., Under Secretary of Commerce for Transportation and ACC chairman.

Selection of ACC for the job came as a surprise and there was doubt in industry as to whether it was the proper body. The last reviews were completed in 1948 by President Truman's Air Policy Commission, headed by Thomas K. Finletter and composed of persons outside government, and by the Congressional Aviation Policy Board.

Text of President Eisenhower's letter to Murray:

"The increasing importance of aviation as an instrument of national policy and to our national welfare makes it desirable that there be available to the government agencies, the aviation industry, and the public, a clear and comprehensive statement of the aviation policies of this Administration.

"In a field as dynamic as aviation, our policies and programs must be flexible and capable of growth. It has been over five years since a broad review of the U. S. aviation policy was completed; many events of major significance have occurred in the interim.

"I therefore request that you, as chairman of the Air Coordinating Committee, direct it to undertake a comprehensive review of our aviation policy, and to prepare a statement of present United States policies in the primary areas of aviation interest, for my consideration and approval. This should be done in consultation with appropriate industry, local government, and private aviation groups."

It marked one of the rare times in aviation history that an intra-government body, other than Congress, has been asked to review policy. Murray, together with Charles F. Willis, assistant to Sherman Adams, the President's top aide, are said to have been urging that a review be made and that ACC make it. Willis is the White House liaison man with ACC.

Some industry observers, although believing that a policy review by the new Administration may be a good thing, were of the opinion that such a review by ACC will not command the same respect as would one made by an outside group. ACC opinions, it is pointed out, must be unanimous—a situation that can lead to "watered down" decisions. There may also be conflict on policy proposals between the Civil Aeronautics Board and the Commerce Department, which Murray has already indicated intends to play a larger role in aviation matters.

There was some opinion that the President's letter was so broad as to leave the scope of the review virtually undefined. President Truman's instructions to the Finletter group had been much more specific. It is felt, however, that the new review will probably deal much more with the civil side than with the military.

Fairchild to Unveil Jet Transport Design

A new delta-wing jet transport design proposal will be submitted to top airline executives by Fairchild Engine and Airplane Corp. later this month for their consideration. Details of the new design have not been available; however it is known that the plane is an outgrowth of Fairchild's decision to spend several million dollars on the development of a jet-powered cargo plane.

First indication of the company's plans to offer a passenger version of the aircraft came in a letter that Walter Tydon, chief engineer of Fairchild, wrote to airline executives inviting them to a conference on the new design in New York in late October.

Helio Courier Gets Type Certificate

CAA has issued type certificate No. 1A8 to the Helio Aircraft Corp. of Norwood, Mass., for the company's four-place Courier lightplane. Commercial production is set for deliveries in 1954. First military production model was recently delivered to the Army.

The all-metal civil version of the Courier is said to cruise at 157 mph and to land at full load in still air at about 34 mph in approximately 220 feet of landing area.

BuAer Orders Turboprop Helicopter Development

The Navy Bureau of Aeronautics has awarded contracts for development of small, turboprop-powered helicopters, it has been learned. The project is believed to be part of BuAer's recent award of highly classified research and development contracts. General Electric 800-900 hp powerplants will probably be used in the helicopters.

The Piasecki HY-16A, powered by two Allison T38's, now under construction, is the only other known military helicopter ordered in experimental turboprop version.

C-W to Supply J65 Jet Engines for Canberra

Curtiss-Wright Corp. will supply J65 Sapphire jet engines for the B-57 Canberra, according to Jess W. Sweetser, vice president of contracts for the Glenn L. Martin Co., after GM's Buick Motor Division has delivered 80 to 100 of the engines.

At a recent press conference in London while visiting English Electric Co., Sweetser also revealed that B-57 operational squadrons would be formed in the "not too distant future"; that the first eight B-57's were duplicates of the British Canberra except for the Sapphires and a rotary bomb door; and that the USAF had ordered a "considerable number" of reconnaissance versions.

Other facts brought out were that the Martin version is 4000 pounds heavier than the British because of more equipment and fuel and heavier engines. No brake parachutes are planned, with the B-57 taking off in 2500 feet and stopping within 3000 feet after landing.

DELIVERED to the United Nations by a North Korean pilot, MiG-15 is shown in this wirephoto in hangar near Seoul.

Technical Data on MiG-15 Revealed

Delivery of MiG into U. N. hands in Korea should round out information already leaked through Iron Curtain.

By ANTHONY VANDYK

A FEW MORE PIECES were added to the West's nearly complete MiG-15 jigsaw puzzle late last month when a North Korean pilot surrendered one of the Russian-built fighters to the United Nations at Kimpo airfield, South Korea.

Like the aircraft brought back to the U.S. for examination in 1951 and the Czech-built Polish Air Force MiG-15's which landed on the Danish island of Bornholm this year, the latest fighter to fall into allied hands is probably a "sanitized" version: planes with the latest equipment are kept within the borders of Soviet Russia. Nevertheless, some information on the latest MiG's has leaked through the Iron Curtain (AMERICAN AVIATION, February 16) and it is now possible to have a fairly complete technical picture of the standard MiG-15.

Perhaps the most interesting of all are the MiG-15's production features which enabled a prototype to be transformed into an operational aircraft in under two years and which made it possible for production to be boosted swiftly to a rate of 450 planes a month. These features include:

- **Overall simplicity** of the airframe design;
- **Use of universal machine tools;**
- **Relatively few castings,** forgings and extrusion types;
- **Comparatively small number** of skilled workers required;
- **Adaptability** to quantity production from the standpoint of breakdown for subassembly operations.

Structurally the MiG-15 is fairly conventional, being of semi-monocoque construction with pressed aluminum formers, extruded stringers and aluminum skin. Rear portion of the fuselage bolts to the center structure, providing easy access to the engine. Steel carry-through structure is used between the nose mid-section and the rest of the fuselage. Two spars are used outboard of the landing gear, the aft spar continuing to the fuselage side while the front spar terminates at the landing gear hinge point. Two 60-pound mass balances are used in the leading edge of each wing near the tip to avoid a critical flutter frequency. Major connecting points incorporate adjustments for hand fitting during assembly.

Average airfoil section thickness is about 11%. Wing controls are of conventional design with internal aerodynamic control balances on the ailerons. Two air flow control fences, about four inches high, are used on the wing upper surface parallel to the line of flight and extending from the leading edge to the flap-aileron hinge line. A serrated plate is incorporated in the horizontal tail surface for ground adjustment of the angle of incidence.

Aileron, elevator, and rudder systems feature extensive use of push-pull tubes and torque tubes. The elevator trim tab is electrically operated. Split Fowler-type flaps are hydraulically operated, as are the dive brakes, but there is provision for emergency pneumatic operation of the flaps and gear.

Armament and electronics vary, but many MiG-15's have two 23-mm and one 37-mm automatic cannon. An airborne radio homing receiver is standard in addition to navigation and communications receivers.

All production versions of the MiG-15 use an engine based on the Rolls-Royce Nene, 25 of which were supplied to Russia by the British company. The team of Petrov and Chelomey had little trouble in designing a copy of the Nene, but the metallurgists (Podorozhniy and Vlasov) working on the project had a more difficult task.

Nevertheless the finished product proved very satisfactory and the latest versions have afterburner, water injection and some of the features of another Rolls-Royce engine, the Tay. Particulars of the various engines used in the MiG-15 and its successors are contained in the accompanying chart; the following chronology recounts the life story of Russia's most famed aircraft.

THE MIG-15 CHRONOLOGY

Date	Event and Location
1944:	Design of prototype of MiG-15 (Focke-Wulf Ta-183 project)—Bremen, DVL Berlin-Adlershof.
1945:	Soviets take Ta-183 data during capture of Berlin—DVL Berlin-Adlershof and Air Ministry. The Chief of DVL, Prof. Bock, is taken to the Soviet Union—Berlin, Ramenskoye (TsAGI, Central Aero- and Hydrodynamic Institute).
1946:	Soviet-German projects and designing work started—TsAGI, Moscow-Ramenskoye.
October:	Heinkel designer Siegfried Guenther under contract to work in the Soviet Union—Berlin, Podberezye Fighter design approved by Gen. Novikov. Gen. Sudets, and Minister of Aircraft Industry M. V. Khrunichev—Moscow.
	1947
Spring:	First flight of first prototype—Test base near Moscow.
July 2:	First flight of second prototype—Test base near Moscow.
1st half:	The first 10 of a total of 25 Rolls-Royce Nenes are delivered to the Soviet Union.
August:	First prototype crashes.
August:	Test flight of new prototype equipped with Rolls-Royce Nene. Test base in the Urals. Designers A. I. Mikoyan and M. I. Gurevich are awarded the Stalin Prize of 150,000 rubles each—Moscow. Series production started—Various plants.
	1948
Early:	Series production at aircraft plant I (Stalin) started—Kuibyshev.
	1949
July:	First public flight of MiG-15 at air show—Moscow-Tushino.
October:	The first Air Force squadrons

Technical Data on the MiG

	MiG-15	MiG-15	MiG-15 1948	MiG-15A	U-MiG-15 1950	MiG-15F	MiG-17 Super-MiG	MiG-19 Tushino '51
Purpose	2d Prototype	3rd Prototype	High-alt. fighter	High-alt. fighter	Trainer	Night fighter	All-Weather fighter	Fighter Prototype
Date of 1st flight	Early '47	Spring '47	End '47	...	...	...	...	...
Prototype	1947	Spring '47	1948	...	...	[9]	1949	1951
In series production	no	no	since '47	since '51	modification	yes	yes	no
Seats	1	1	1	1	2	2	2	1
No. of engines	1	1	1	1	1	1	2	2
Thrust (lbs.)	2,200	4,620/5,940	5,940[16]	5,940	5,940	5,940?	2x3,960	2x3,960
Engine type	?	Axial/ Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Axial	Axial
Engine model	Petrov Chelomey	M-004B later RD-45	RD-45 (RR-Nene) or RD-45-F	Klimov VK-1[11]	RD-45 Chelomey	RD-45? Chelomey	BMW-003 or Shvetsov M-004 H	Shvetsov M-018
Length (ft.)	39.86	36.25	36.25	36.25	36.25	37.07	43.99	...
Height (ft.)	13.12	11.15	11.15	11.15	11.15	...	13.78	...
Span (ft.)	33.07	33.07	33.07	33.07	33.07	33.07	41.40	...
Wing area (sq. ft.)	269.09	256.18	254.88	254.88	254.88	...	334.11	...
Weight, empty (lbs.)	5,940	7,920	8,316	...	...	...	...	...
Fuel weight (lbs.)	4,400	4,070	...	...	...	...	3,080	...
Fuel tank capacity, Inner (gals.)	...	330	330	372	...	...	449	...
Outer (gals.)	...	264	317	129	...	...	...	...
Normal take-off weight (lbs.)	10,890	10,703	12,408	11,062	...	...	14,808	...
Maximum take-off weight (lbs.)	...	13,580	14,207	...	...	...	...	...
Wing loading (lbs./sq. ft.)	40.96	53.25	55.71	43.42	...	...	44.65	...
Power loading (lbs./sq. ft.)	8.19	18.02	23.76	23.76	...	...	23.76	...
MPH at	...	667[17]	665	...	...	572	633	...
altitude (ft.)	...	40,000	...	...	...	...	...	...
MPH at	...	646[17]	672	683	...	597	648	...
altitude (ft.)	...	16,400	...	3,900	...	...	...	...
Mach number			0.89	[13]				
Cruising speed (mph)	...	...	...	470	...	...	...	...
at altitude (ft.)				1,300				
Landing speed (mph)	...	108.73	108.73	130.48	...	[10]	...	...
Rate of climb		140	131-			115-	100	
(ft./sec.)	...		190	...	...	120	-130	...
Altitude (ft.)	...	32,800	...	6,560	...	...	24,900	...
reached in minutes	...	8	...	2	...	...	5.2	...
Absolute ceiling (ft.)	...	...	51,000	...	...	...	48,000	...
Service ceiling (ft.)	...	49,200	49,200	49,200	...	...	44,900	...
Endurance (hours)	0.3	1[14]	...	up to 2	...	...	...	...
Cannon (No. &	...	1-20 mm	2-23 mm	2-23 mm	...	4-20 mm	2-23 mm	...
caliber)		1-32 mm	1-37 mm	1-37 mm[12]				
Alternate armaments				...	...	2-20 mm	4-30 mm	...
(No. & caliber)	...	2-23 mm	2-40 mm[15]			2-23 mm		
Rockets	...	...	6	...	...	6	...	...
Auxiliary fuel tanks,			1 or 2 x	1 or 2 x		2		
capacity (gals.)	...	...	160	130	none	...	...	...
Bombs (lbs.)	...	1,100	yes	yes	...	...	...	...
Remarks—see note.								

[1] *This aircraft was first erroneously called the Yak-19 or Yak-21. The main difference between it and the later MiG-15 versions was the T-shaped tail assembly which was to be tested. The exhaust in the tail of the fuselage turned out to be too long.*

[2] *This version and a subsequent pre-production model were slightly smaller than the 1948 series version. It was tested with different wing profiles. Chord 105.5". Dimensions: length, 32.67 ft.; span, 32.15 ft.; wing area, 215.28 sq. ft.*

[3] *Nearly all standard aircraft of this type are equipped with pilot ejection seats.*

[4] *MiG-15-A is the model in which Lt. F. E. Jarecki landed on Bornholm. His flight speed was reportedly 682 mph.*

[5] *Modification of standard MiG. Has been observed as operational aircraft since 1950.*

[6] *Cabin length 4.92 ft. Radar set in nose. Wing tips rounded. Fuselage longer than that of standard version. Double nose wheel.*

[7] *Also called "Flat MiG." Was observed a few months ago in Korea.*

[8] *This design does not belong to the MiG series.*

[9] *The first MiG-15F's were observed in the Soviet Zone of Germany in March, 1952.*

[10] *Very high landing speed as compared to 1948 model of MiG-15.*

[11] *11,500 rpm. 9 Combustion chambers. Uses T-77 (kerosene) fuel.*

[12] *37-mm cannon with 40 rounds. The two 23-mm cannon carry 80 rounds each. The Polish aircraft (Jarecki's) was equipped with an obsolete gyroscopic gunsight.*

[13] *Despite the maximum speeds quoted, the MiG-15, according to statements of its Polish pilot, has not yet been flown at supersonic speeds.*

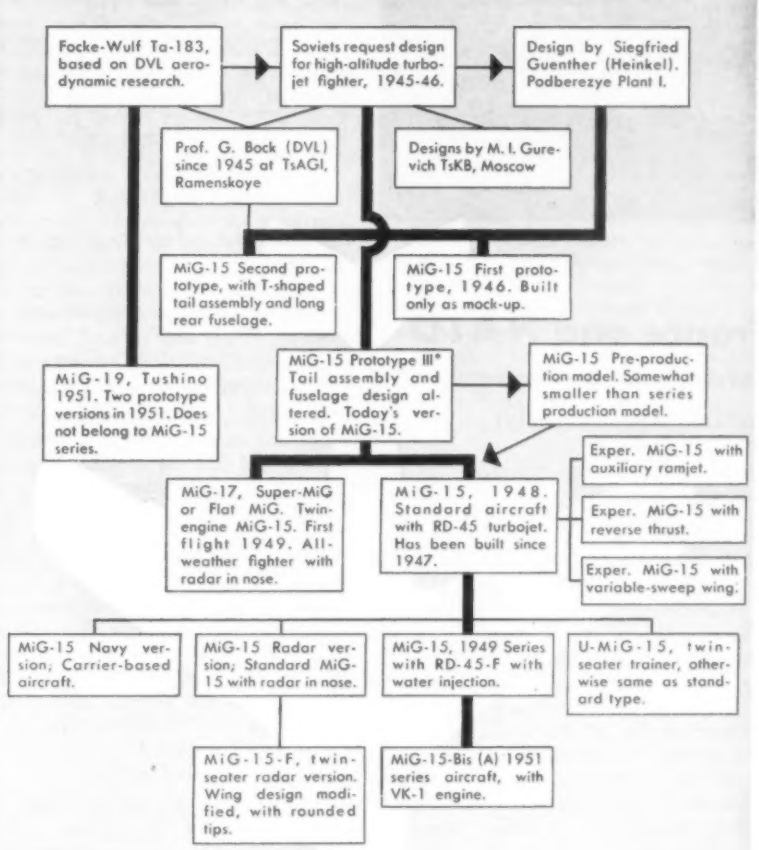
[14] *Actual duration of flight was slightly more than 20 minutes.*

[15] *Five alternate armaments are known, one of them consisting of four 20-mm cannon.*

[16] *Thrust with water injection 6736 lbs. Diameter of the RD-45 5.57 ft. (same as that of Rolls-Royce Nene). Fuel consumption 2.5 lbs./lb./hr. Power plant weighs about 1980 lbs. The afterburner which has been installed recently provides an additional thrust of 990 lbs.*

[17] *Performances of the smaller first production models (developed from Prototype 3) are quoted as follows: Max. speed 667.35 mph at 40,000 foot altitude, 646.22 mph at 24,600 foot altitude. Cruising speed 500.20 mph at 40,000 ft. Rate of climb at seal level 144.35 ft./sec. Service ceiling 45,900 ft. Range 435-777 miles, depending on fuel reserves. The weight data are also different, being: normal takeoff weight 9988 lbs., maximum take-off weight 12,980 lbs.*

HISTORY OF THE MiG-15


Focke-Wulf Ta-183, based on DVL aerodynamic research.
Soviets request design for high-altitude turbojet fighter, 1945-46.
Design by Siegfried Guenther (Heinkel). Podberezye Plant I.
Prof. G. Bock (DVL) since 1945 at TsAGI, Ramenskoye
Designs by M. I. Gurevich TsKB, Moscow
MiG-15 Second prototype, with T-shaped tail assembly and long rear fuselage.
MiG-15 First prototype, 1946. Built only as mock-up.
MiG-19, Tushino 1951. Two prototype versions in 1951. Does not belong to MiG-15 series.
MiG-15 Prototype III* Tail assembly and fuselage design altered. Today's version of MiG-15.
MiG-15 Pre-production model. Somewhat smaller than series production model.
Exper. MiG-15 with auxiliary ramjet.
Exper. MiG-15 with reverse thrust.
Exper. MiG-15 with variable-sweep wing.
MiG-17, Super-MiG or Flat MiG. Twin-engine MiG-15. First flight 1949. All-weather fighter with radar in nose.
MiG-15, 1948. Standard aircraft with RD-45 turbojet. Has been built since 1947.
MiG-15 Navy version; Carrier-based aircraft.
MiG-15 Radar version; Standard MiG-15 with radar in nose.
MiG-15, 1949 Series with RD-45-F with water injection.
U-MiG-15, twin-seater trainer, otherwise same as standard type.
MiG-15-F, twin-seater radar version. Wing design modified, with rounded tips.
MiG-15-Bis (A) 1951 series aircraft, with VK-1 engine.

*At first equipped with German turbojet, later with British Rolls-Royce Nene engine.

are being equipped with the new model—USSR.

1950

February: The MiG-15 prototype becomes known abroad under the wrong name of Yak-21—USA, Britain.

July/Aug.: Nationalist Chinese intelligence establishes presence of several Yak-21 squadrons in China—Shanghai, Canton.

September: MiG-15's sighted for the first time along the Yalu River—Korea.

End: First units in the Soviet Zone of Germany are equipped with MiG-15's—Berlin area.

Nov.-Dec.: First air battles with MiG's—Korea.

1951

Middle: Monthly production set at 22 aircraft, capacity calculated at 400—USSR.

July 1: Parts of a MiG-15 captured—Korea.

September: Slightly damaged MiG-15 recovered from the sea off northwest coast of Korea—Yalu River.

October: Captured MiG-15 is examined by USAF, Pratt and Whitney, and United Aircraft Corp.—Wright Field, Dayton, O.; East Hartford, Conn.; wind tunnel at Buffalo, N. Y.

1952

Feb.: 500 to 600 MiG's stationed in the Soviet Zone of Germany—Mecklenburg, Saxony, Berlin region.

March: Radar version of MiG-15 observed in the Soviet Zone of Germany for the first time.

April: Two-seater version with radar equipment stationed in Soviet zone of Germany—Finow and Werneuchen.

May: Letov plant in Czechoslovakia starts series production of MiG-15—Prague-Kbely.

June: Night-fighter version operational—Korea.

July: Special series of 120 carrier-based MiG-15's built—Soviet Union.

August: News of two-seater trainer version of MiG-15—Published in Britain.

Sept.: Reversible turbojet engine tested in MiG-15—Parchim/Soviet Zone of Germany.

Oct.: Tests of MiG-15 with ramjet, and of model with variable sweep wings—Test base near Moscow.

Oct.: Letov producing 15 MiG-15's per month—Prague-Kbely.

1953

February: Production of MiG started in Poland—Mielec.

Mar. 5: Polish pilot escapes in MiG-15bis—Ronne, Bornholm.

May 20: Second Polish pilot escapes in more recent model—Ronne, Bornholm.

Sept.: MiG-15 is to be replaced by a new design—USSR.

Sept. 20: Northern Korean pilot escapes in MiG-15—Kimpo airport. • • •

Airworthiness Review Discusses 'Copter Rules

Marked by the absence of controversial airworthiness and performance rule proposals of past years, the Civil Aeronautics Board's annual review of airworthiness regulations met in recent session and disposed of its agenda ahead of schedule. Meeting was highlighted by discussion of transport and normal category helicopter rule-making and suggested regulations on penalty testing of engine parts.

General agreement was reached on the need for distinction between helicopters for transport and normal category operation, but opinions varied on how to make the distinction. Discussion ended with agreement that CAB's bureau of safety regulation would propose a basis for establishing the two helicopter categories, which would be submitted to industry for comment.

Both CAA and the engine manufacturers cited their opposition to a proposed rule that would impose more stringent penalty tests for engine parts.

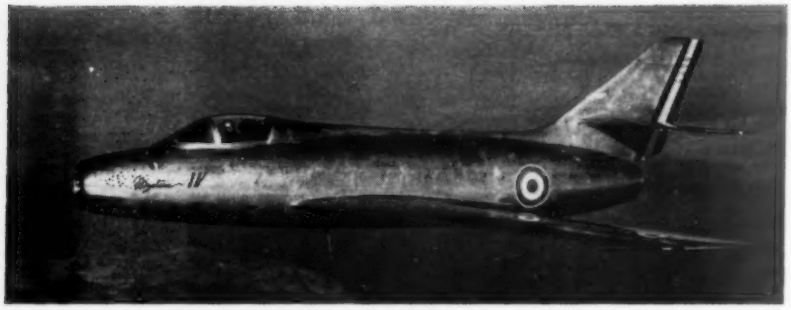
Second Parrish Scholarship Announced

Winner of the second annual Wayne W. Parrish Scholarship at Parks College of Aeronautical Technology of St. Louis University is John Francis Reilly of Denver, Colorado, according to an announcement by the University.

This is the second scholarship at Parks presented this year in the name of the editor and publisher of AMERICAN AVIATION in a program which will sponsor a new student each year and provide tuition for the complete three-year engineering program of the college. By 1955 there will be three scholarships running simultaneously.

Reilly, 17, is a graduate of St. Francis de Sales high school where he was editor of the school paper, a member of the debating team and the dramatic club, and a letterman, playing football and basketball.

Parrish established the scholarships to set an example of one way in which the aviation industry can help in alleviating the engineer shortage which has plagued it in recent years.



STAR PERFORMER for Dassault is the Mark Four Mystere; first production aircraft is due next April.

Dassault Builds for France and NATO

Firm is only Continental company producing its own aircraft for both buyers; subcontracting extensive.

(The second in a series of articles on the European aircraft companies involved in the NATO plane production program by AMERICAN AVIATION*'s Manufacturing Editor, Robert M. Loebelson.—Ed.)*

PARIS—Avions Marcel Dassault, the only Continental aircraft firm in the North Atlantic Treaty Organization program to produce a plane of its own design for both NATO and the air force of its own country, is convinced that it will have no trouble in meeting schedules calling for delivery of 225 Mystere 4A jet interceptors to NATO by the end of 1955. First production model is scheduled to come off the line at Dassault's Argenteuil plant near here next April.

There is little reason to doubt that the non-nationalized aircraft producer will meet those delivery schedules. Not only is it producing a jet which officials of the USAF have labeled a top-notch airplane in the same class with the F-86 Sabre, but it will shortly wind up production of 350 Ouragan jet fighters—experience which will be invaluable when assembly of Mystere 2's and 4A's begins.

Seventy-one of the Ouragans delivered by Dassault were intended for use by the French Air Force but were purchased by India. The money India is paying for these earlier jets presumably will be used by the French to purchase Mystere 4A's. At the present time, however, Dassault is slated to turn out:

- **150 Mystere 2's** (MD 452 Mark 2's) for the French Air Force;
- **225 Mystere 4A's** for NATO;
- **10 Mystere 4A** pre-production prototypes for the French Air Force;
- **Two Mark 4B** day interceptors using more powerful engines than the Hispano-Suiza-built, Rolls-Royce-licensed Tay.
- **One Mark 4N** two-seat all-weather interceptor with a nose similar to the F-86D to permit the use of more radar equipment.

NATO and Mutual Security Agency (now Foreign Operations Administration) officials told AMERICAN AVIATION the overall Mystere procurement program at present calls for the purchase of 393 planes at a total cost of nearly $178 million. This breaks down as the 225 Mark 4's for NATO (with the U. S. putting up $86,540,000) and the remaining Mark 2's and 4's for the French (with the French government paying $91 million).

The Mark 2 to be built by Dassault for the French Air Force will be powered by the French-designed Atar 101C engine developing about 6400 pounds of thrust, but the NATO version will use the Tay (renamed the Verdon by Hispano-Suiza) which produces about 7700 pounds of thrust. However, the Mark 4B, which Dassault is hoping to sell to France, has been redesigned slightly so that it can use either an Atar 101D with afterburner (8000 pounds), an Armstrong-Siddeley Sapphire (8300 pounds), or a Rolls-Royce Avon (9000 pounds). First installation in the two Mark 4B prototypes will be an Avon, but all three engines will be tried out to determine which gives the best performance.

The 10 Mark 4A's now under construction for France as pre-production models will in a sense also be prototypes because the French Air Force will be flying them with alternate pieces of equipment. The final Mark 4A which goes into production for both NATO and France will be firmed up as a result of the shakedown flights with the 10 early models.

While the Ouragans and Mystere 2's and 4's currently on order contain almost no American-built equipment, the Mark 4N all-weather version will have to contain several pieces of U. S. radar and fire-control equipment if the two-seater is ever ordered into production. Dassault officials admit that France's electronics industry is not now prepared to turn out the electronic devices which would enable the Mystere to evolve into an all-weather craft.

One of the biggest advantages that Dassault has in meeting its delivery schedules for both the Ouragan (about 50 of the 350 still to be assembled) and the Mystere is the fact that France's aircraft industry generally is far from peak production and experienced subcontractors are easy to find. Some Dassault officials think, as a matter of fact, that subcontractors are too available.

In the case of the Ouragan contract, for example, Dassault, which designed and had the capacity to produce almost the entire plane itself, was compelled to farm out about 80% of the work to other firms under the terms of its contract with the French government. Most of the subcontracting was given to two nationalized companies—SNCASE, which built the fuselages, and SNCASO, which produced the wings. Dassault was left with fabrication of the tail sections and final assembly of the 350 planes. The tail sections are produced at a plant in Talence, near Bordeaux.

The same situation is true, to a lesser extent, in the Mystere contracts. Again SNCASE will be responsible for the fuselages and SNCASO the wings, but the first 50 of the 225 Mystere 4A's built for NATO will be handled by Dassault alone.

As for work beyond the Mystere 4 series, Dassault has proposals out for a folding wing version of the Mark 4 for the French Navy, an enlarged Mystere (just as the U. S. F-100 evolved from the F-86), a delta-wing lightweight interceptor, and several pilotless aircraft. • • •

Inquiry Considers VFR Traffic Control

Recent three-day CAB public inquiry into the mid-air collision last month of a United Air Lines Convair 340 and an American Airlines Convair 240 was highlighted by the joint recommendation of UAL and the Air Line Pilots Association that a study be made of air traffic control under VFR conditions, both during en route operations and at high density terminal areas. ALPA also urged the early requirement of rotating beacon-type aircraft exterior lights.

News Briefs

First production model of the Douglas A3D is to go through routine evalution tests as a result of the change from the Westinghouse J40 engine to P&W's J57.

•

A pipeline for jet fuel stretching 1800 miles through Europe will be laid by NATO, with land contributed by the countries through which it passes, according to NATO's assistant secretary general for production and logistics, Lowell P. Weicker. The pipeline will have a capacity of more than 25,000 cubic yards a day.

•

Sixty-nine DC-7's are now on order, with Panagra becoming the fifth carrier to buy the Turbo-Compound-powered aircraft. Five transports will be delivered to the carrier by mid-1955.

•

A bill which would have provided a five cent refund on Alabama's six cent gasoline tax for aviation users has been vetoed by Governor Gordon Persons after being overwhelmingly approved by both houses of the state legislature.

•

The feud is on again between Rep. Alvin E. O'Konski (Rep., Wis.) and the Kaiser interests. O'Konski has sent a letter to Defense Secretary Charles E. Wilson demanding that the Government refuse to do any more business with Kaiser and charging that political influence during the Truman Administration accounted for the contracts given to Kaiser then. Edgar F. Kaiser branded the statements "incorrect and misleading."

•

Helicopter developments in Europe are being surveyed by two officials of the Kaman Aircraft Corp., Rene H. Miller, vice president of engineering, and William R. Murray, chief of test operations. Murray is acting on behalf of the Office of Naval Research as well as his own firm.

•

Decline in piloted aircraft during the next 10 years is foreseen by the manager of Minneapolis-Honeywell's guided missile section, John V. Sigford. Two-thirds of the weight, space and equipment in a modern plane is needed for carrying and protecting the pilot, Sigford observed.

•

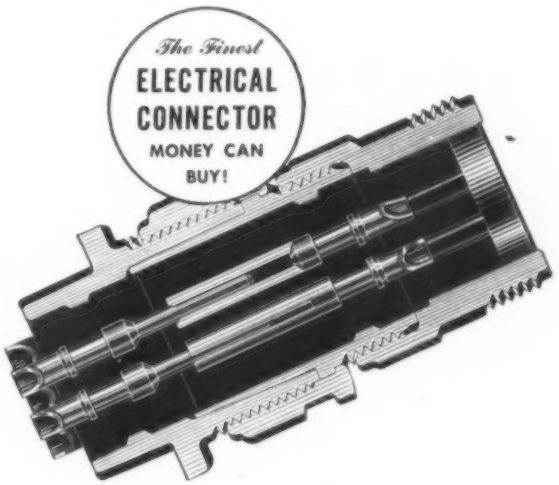
Inauguration of non-stop transcontinental service by American Airlines with its new DC-7's is scheduled for November 29. An eastbound flight has been set up on a 7 hour, 15 minute schedule; westbound schedule is set at 8 hours.

•

The price of a Riley Twin Navion Conversion has been increased from the original $25,850 to $28,500, according to Riley Aviation Sales.

SCINFLEX ASSURES
YOU THE LOWEST VOLTAGE
DROP IN THE INDUSTRY!

When operating conditions demand an electrical connector that will stand up under the most rugged requirements, always choose Bendix Scinflex Electrical Connectors. The insert material, an exclusive Bendix development, is one of our contributions to the electrical connector industry. The dielectric strength remains well above extreme requirements within the temperature range of −67°F to +275°F. It makes possible a design increasing resistance to flashover and creepage. It withstands maximum conditions of current and voltage without breakdown. But that is only part of the story. It's also the reason why they are vibration-proof and moisture-proof. So, naturally, it pays to specify Bendix Scinflex Connectors and get this extra protection. Our sales department will be glad to furnish complete information on request.



BENDIX SCINFLEX
ELECTRICAL CONNECTORS

• Moisture-Proof • Radio Quiet • Single Piece Inserts • Vibration-Proof • Light Weight • High Insulation Resistance • High Resistance to Fuels and Oils • Fungus Resistant • Easy Assembly and Disassembly • Fewer Parts than any other Connector • No additional solder required.

Bendix
SCINTILLA MAGNETO DIVISION of Bendix AVIATION CORPORATION
SIDNEY, NEW YORK

Export Sales: Bendix International Division, 205 East 42nd St., New York 17, N. Y.
FACTORY BRANCH OFFICES: 117 E. Providencia Ave., Burbank, Calif. • Stephenson Bldg., 6560 Cass Ave., Detroit 2, Michigan • Brouwer Bldg., 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California.

WHERE WILL THE MONEY COME FROM?
$1,032,200,000
COST OF JET FLEET: $756 million (126 planes)
THIS MUCH TO GO $670 million
COST OF PISTON FLEET: $276.2 million
THIS MUCH ON TAP $362.2 million*
$0
*from: 1. working capital 2. net book value of flt. equipment 3. special funds

DOMESTIC TRUNKS must raise nearly two-thirds of a billion dollars by 1960 in order to acquire their jet fleet.

Where Will We Get the Money for Jets?

Carriers face major financing problem; funds available come nowhere near estimated cost of equipment.

By PHILIP A. FITZSIMONS

LEADERS of the domestic U.S. commercial air transport industry have been predicting the advent of jet transport service between now and 1960 but the airlines have not seen their way clear to officially place an order for a single jet transport.

The reluctant air carriers explain their position by saying that no aircraft manufacturer can offer an economical jet for sale. The manufacturers explain their sluggish performance by saying they are not being pressured by the carriers for a jet and in view of its tremendous developmental costs (in which the carriers are not participating) and high unit costs they are not rushing their jet transport projects.

So the question arises, will a jet fleet, in fact, materialize? Reviewing major influences on fleet modernization programs a CAB report said:

> "The history of equipment purchases leaves little doubt that the stimulus of competition has been in the forefront of the factors influencing airline management in its constant search for new equipment. Thus, new equipment has traditionally been placed in operation first on the most competitive segment, and the introduction of more modern aircraft by one company on such a route has been followed by a scramble on the part of competitors to introduce with the greatest possible speed comparable or more advanced types."

The Board went on to observe:

> "The acquisition of new-type equipment has not been halted by adverse economic conditions or pessimism over the prospects of the industry in the foreseeable future. What might be termed 'luxury' equipment has been introduced at times and under conditions that virtually precluded a conclusion that economic considerations, other than competitive ones, warranted or prompted the action."

Competition, therefore, if nothing else, should make jet transport service a reality in the near future.

An analysis of the air carriers' tremendous financing problem in introducing this new jet equipment is overdue.

Two key questions need answering:

- **"What is the best estimate** of the size and cost of such a fleet which route structures and traffic volume will warrant?"
- **"Will the carriers be able** to accumulate the dollars necessary to purchase this jet equipment?"

American Airlines has reviewed the jet transport requirements of the domestic trunklines and has estimated the industry need to be 30% to 40% of the domestic four-engine fleet of 421 aircraft. The accompanying table substantiates this requirement by comparing future passenger-mile estimates and jet capacity based on generally accepted assumptions of jet aircraft operations. The lower of the estimates requires 126 jet transports, a capital outlay of $756 million, based on a per aircraft cost of $4 million and a cost of spare parts and replacements estimated at 50% of the total cost. The high expenditure estimates for spares and replacements are due to factors such as entirely new aircraft type, much shorter engine overhaul periods, and small number of craft to be ordered.

This does not constitute, however, the carrier's present total capital required for fleet replacement. A large number of piston aircraft undelivered and on order will require an estimated additional capital outlay of $276 million, for an estimated grand total of $1,032,200,000 needed for equipment between now and 1960.

Do the carriers have the money to purchase this equipment? The graph above reveals that the combination of available working capital, net book value of present flight equipment, and existing special funds is by no means adequate.

Assuming the carriers' working capital position can remain as sound as it was at year end March 31, 1953, and deducting one and one-half months cash operating expenses, they would have available $44,362,275 in working capital. In addition $284,592,717—as the net book value of flight equipment—will be made available from depreciation charges and residual values. This takes no consideration of additional cash which may come from disposing of some of the DC-3's and DC-4's

which may no longer be required in the trunklines' operations. Most of these aircraft are carried at a residual value much lower than the expected market price.

It should be clear, however, that the difference between the present costs of new aircraft and the postwar purchase price of the aircraft to be replaced may be as much as three or four times the book item. In theory, depreciation charges provide the means to pay for loans made for the purchase of equipment, and to accumulate reserves which can be used for acquiring new planes when necessary. Present depreciation charges appear to be adequate only to take care of the loan provisions.

It should be noted that the trunklines are carrying $21,872,207 in construction work in progress as of March 31, 1953. How much of this will be transferred to the original cost of flight equipment is unknown; however, it may be assumed that a sizeable part of this money will be a source of capital.

Capital from special funds is of course not entirely available for flight equipment purchases. However, the trunklines carried $31,465,000 in this account as of March 31, 1953.

Thus total available capital would amount to between $360 and $370 million, leaving an approximate $670,000,000 to be obtained by "plowing back" into the business future earnings, generating bank loans, and through equity financing.

Why hasn't the industry been able to accumulate this much needed capital? A look at the airlines' financial record answers the question by revealing that their financial status has always been insecure. Here is an industry subject to sudden and violent fluctuations of revenues and expenses, whose earning prospects have never stabilized. As recently as 1951 there appeared to be a bright financial future for the trunkline carriers. However it failed to materialize in 1952, when operating revenues increased only 16.7% as operating expenses increased 21.7%, and net operating income decreased 10.2% below the 1951 level.

This low earnings condition has been caused in part by stable fares keeping operating revenues down (see table) while increasing salaries and wages, gasoline and oil, and materials and supplies costs have been boosting operating expenses. The removal of price and wage controls in late 1952 allowed the inflationary spiral to continue; and although their levels reached a plateau and have since slightly declined, crude oil prices were raised again in mid-1953.

Estimated Passenger-Miles for Jets

Compared to Estimates of Traffic for Year 1960

Estimates of Passenger-Miles—1960	
Air Transport Assn. (Domestic)[1]	19,800,000,000
CAA[2]	18,000,000,000
Estimated Passenger-Miles over 500 Miles—1960 39.2% of Total[3]	
ATA	7,761,600,000
CAA	7,056,000,000
Jet Capacity per Year—(See note)	
30% of four-engine fleet (126)	11,993,870,000
Jet Passenger-Miles at 65% Load Factor	
30% of four-engine fleet (126)	7,796,015,500

NOTE: Jet aircraft assumptions: eight hours utilization, 450 mph, 75 seats per aircraft, and 96.59% operating factor.

[1] Article by Admiral Land in "Planes" magazine, Vol. 8, No. 9, October, 1952.
[2] Airline Passengers, CAA, Airport planning publ., December, 1951.
[3] First 100 pairs of cities ranked according to passenger-miles, March, 1952.

This increase alone will add an estimated $12 million in gasoline costs to the airlines' operating expenses during 1954, according to recent testimony by Milton W. Arnold, ATA vice-president, before the House Commerce Committee.

Furthermore, each year has seen air coach service take an increasingly large part of the overall business. More than 22% of total domestic trunkline passenger traffic at present is coming from this service, compared to 19% and 12.5% at years' end 1952 and 1951, respectively.

The financial byproduct of increased air coach traffic has been a narrower margin of profit, reflected in decreasing revenue ton-mile yields. As this trend continues the trunklines' earnings position will become much more vulnerable to declines in traffic, which would surely result from a decline in the general level of business.

In the present period of increasing and modernizing flight equipment vast funds have been and will continue to be required, as the current aircraft are many times more expensive than their predecessors. Annual depreciation charges are now greater than ever before and will surely increase for the more costly aircraft. These charges are major elements of costs, along with interest on and retirement of debt financing and provisions for dividend payments. All of them must be absorbed by operating revenues. Declining earnings in the face of these increasing requirements are obviously undesirable.

Yet how much of the capital requirements can the trunklines expect to meet through accumulated cash earnings? If we allow dividends on common and preferred stock to take 40% of the earnings each year, the trunklines would be able to retain earnings amounting to $242,765,649 by 1960, using the optimistic profit level of the year ended March 31, 1953. It should now be clear that even under the most optimistic earnings conditions internally generated funds will not be adequate to meet the capital requirements of the trunklines for a jet fleet.

The remaining capital requirement of approximately $430 million should come from equity financing, or short-term debt obligations maturing concurrently with the depreciation of the financed equipment, or even greater earnings. In view of the spotty dividend

Trend of Air Fares

Compared to Rail Fares and Price Indices

	AIR			RAIL PARLOR CAR		INDICES	
	Pass. Revenue per Pass.-Mile	Revenue Adjusted for Inflation of Dollar Since 1939[1]	Index	Pass. Rev. per Pass.-Mile	Index	Consumer Price Index	Wholesale Price Index
1939	5.10	5.10	100.0	2.33	100.0	100.0	100.0
1946	4.62	3.28	90.6	2.45	105.2	140.9	157.1
1947	5.04	3.13	98.8	2.74	117.6	161.2	197.3
1948	5.75	3.31	112.7	3.01	129.2	173.6	214.1
1949	5.76	3.35	112.9	3.14	134.8	171.9	201.0
1950	5.54	3.19	108.6	3.25	139.4	173.6	209.5
1951	5.59	2.98	109.6	3.27	140.3	187.5	229.0
1952	5.54	2.90	108.6	3.35	143.7	191.0	223.0

[1] Based on Consumer Price Index.

record of the trunklines and the general decline in air transport stock movements, little dependence can be placed on the trunklines' ability successfully to issue stocks in sufficient number to acquire capital for new equipment financing.

Nevertheless, the carriers have a great deal to do in building up their equity positions. It is felt a stronger dividend policy, using at least 40% of annual earnings, is a must in order that the carriers can successfully compete for investment consideration among other industrials and arrive at the point where equity will be able to support future large scale operations.

In addition to what can be obtained from equity financing, the carriers may well be able to finance the remaining piston engine fleet to be acquired before jets through the means of self-liquidating short-term debt obligations. Retirements of these obligations made possible by funds set aside to cover depreciation (cash throw-offs) must be supported, however, by an adequate level of earnings.

Level of Earnings

It is felt that a review and appraisal of the trunklines' earnings position should be made only when full consideration is given to these factors having such great bearing on the carriers' ability to finance the inevitable jet fleet. From this review the CAB and trunklines as a group should be able to arrive at a proper measure of an adequate earnings level for this industry. Only after such a level or area of earnings is established should attention be given to the fare structure.

At present 10 of the 14 domestic trunklines have reached a subsidy-free status. The CAB recently furnished to the subcommittee on Treasury-Post Office appropriations of the House Appropriations Committee an estimate of subsidy pay expected to be paid the domestic trunklines during 1953 and 1954. The 1953 estimate was but $4,444,000 and the 1954 estimate was a reduction to $3,708,000.

How insignificant these sums are, considering that the trunklines' total operating revenues at 12 months ending March 31, 1953 were $802,787,967. In fact the 1954 estimated subsidy is less than one-third the earlier mentioned estimated increase in gasoline costs of $12 million for the same year.

In the interest of preventing a return to subsidy, the CAB should realize the need for appraising the reasonableness of earnings of a subsidy-free industry with a different set of attitudes and approaches than have been employed during the years of underwriting financial needs with taxpayer's money.

The anomalous situation of cheapening of the price of its product when the demand is great and attempting to increase its price when the demand has fallen off seems unique to the air carriers. Such a tendency has been due largely to pressures from the CAB; from all appearances the proposed General Fare Investigation was no exception. A more intelligent approach to measuring the longterm financial needs of this industry and the accompanying required level of earnings is an obvious necessity. • • •

Doolittle Lists 10 Aviation Milestones

SPEAKING before the National Petroleum Association last month, one of the nation's top airmen, General Jimmy Doolittle, vice president of Shell Oil Company and chairman of the National Committee to Observe the 50th Anniversary of Powered Flight, gave his impression of the 10 most significant events in the last 50 years of aviation:

Doolittle

1. The first powered, controlled flights by the Wright brothers in 1903.

2. The cross-channel flight of Louis Bleriot in 1909, a dramatic demonstration of the ability of the airplane to cross international boundaries.

3. The trans-Atlantic flight of Commander Albert C. Reade in the U. S. Navy's NC-4 in 1919, which showed the potential of the airplane for intercontinental movement.

4. The New York-to-Paris flight of Charles A. Lindbergh in 1927. A spectacular achievement by a man with great popular appeal, this flight fired the imagination of millions all over the world.

5. The establishment and improvement of airports. Planes are no good without fields from which they can take off and on which they can land, or without adequate facilities for service.

6. The development of aids to aerial navigation. This includes the laying out of well charted airways and the development of ILS, GCA, radar, and other types of equipment for accurate, safe navigation.

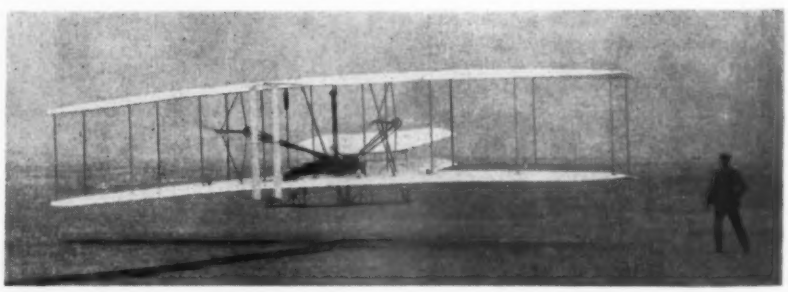
7. The jet engine, which emerged as a practical source of power just about the time the reciprocating engine-propeller combination was reaching its maximum development.

8. Nuclear weapons. These increase the potential of military aviation by many orders of magnitude, and will stimulate the constant, vigorous development of military aviation that will, in turn, inevitably and favorable affect commercial aviation.

9. The piercing of the so-called sonic barrier, which opened the way to far greater speeds.

10. The development of the jet transport for passenger use, which will permit great increases in man's ability to utilize his all-too-limited time and energy, for both work and recreation.

Doolittle singled out "several phases" of aviation's growth as significant: the traveling air carnivals which aroused curiosity and interest; the air races which introduced competition and raised money for technical development; and finally the famous flights which focused world attention on the aircraft's potential. • • •



ONE OF THE BIG TEN: The Wright Brothers' first flight, shown above in a long-lost photograph, heads the list.

First Full Radar Traffic Control Solves Bad Weather Jams at Washington National Airport *

Gilfillan ASR-1 and PAR-1 at Washington National Airport

Credit for developing the successful radar procedure at Washington National Airport goes to CAA and a special Traffic Control Committee including representatives of Air Transport Association, Airline Pilots Association, Air Force, Navy and Coast Guard. Gilfillan is proud of the part Gilfillan GCA plays in this achievement.

RESULTS OF FULL RADAR TRAFFIC CONTROL OVER 6-MONTH PERIOD

- IFR capacity of airport doubled.
- Traffic delays due to weather cut ⅔.
- "Stacking" practically eliminated.
- Departure delays cut from maximum of 2 hours to 10 minutes.
- Delays due to missed approaches or lost aircraft virtually eliminated.
- Time required to unsnarl wholesale shifts from VFR to IFR flight plans materially reduced.
- Safety of terminal-area traffic increased.

* (As reported in Aviation Week)

OPERATIONAL STATISTICS

(Covering 2-month bad-weather period during winters of 1952 and 1953)

1952, WITHOUT RADAR: 2,239 IFR operations. Traffic delay 76 hr. 58 min.

1953, WITH RADAR: 5,570 IFR operations. Traffic delay: 9 hr. 9 min.

GENERAL MILTON ARNOLD, ATA Vice-President for Operations, said that radar traffic control permits airline IFR operations at virtually the same capacity as VFR and has shifted the airline operating bottleneck from the air to the ground.

RADAR EQUIPMENT

LONG RANGE (100-MILE) RADAR to guide air traffic to four major approach fixes.

GILFILLAN GCA SURVEILLANCE RADAR to guide air traffic from approach fixes to final approach.

GILFILLAN GCA PRECISION RADAR to guide air traffic on final approach.

In GCA, Radar, and Electronics Research, Design and Production—

the FIRST name is... Gilfillan

Los Angeles

GCA

Seats Lost Because of No-Shows

FIRST CLASS	1st Quarter	2nd Quarter	May	June	July
Sales Demand (1)	594,699	799,398	265,756	274,178	260,718
TSBA3 (2)	94,129 (15.8%)	123,812 (15.5%)	42,384 (15.9%)	42,050 (15.3%)	39,800 (15.3%)
Re-Sale Potential (3)	7,844 (1.3%)	11,464 (1.4%)	4,136 (1.5%)	4,381 (1.6%)	3,372 (1.3%)
Seats Lost Because of No-Shows	4,642 (0.78%)	7,776 (0.97%)	2,762 (1.0%)	3,123 (1.1%)	2,310 (0.89%)
COACH SERVICE					
Sales Demand (1)	107,951	164,128	52,314	61,999	68,108
TSBA3 (2)	13,038 (12.0%)	18,693 (11.4%)	6,091 (11.6%)	7,278 (11.7%)	7,528 (11.0%)
Re-Sale Potential (3)	1,585 (1.5%)	2,551 (1.5%)	717 (1.4%)	1,074 (1.7%)	1,154 (1.7%)
Seats Lost Because of No-Shows	1,019 (0.94%)	1,823 (1.1%)	501 (0.96%)	804 (1.3%)	851 (1.2%)

(1) Sales demand is sum of seats sold and flown plus estimated seats "lost."

(2) Total seats becoming available for re-sale within three hours of departure on account of no-shows, late cancellations and misconnects.

(3) Seats that could have been re-sold to wait-list customers providing they had been available at least three hours before departure.

Just How Bad is the No-Show Problem?

Seat sales actually lost as result of no-shows average less than one per cent, ATA study shows.

By Eric Bramley

FOR THE PAST several months a study has been underway that may revolutionize airline thinking on one of the oldest and most troublesome traffic and sales problems—the "no-show" passenger and what he costs in lost revenue.

Airlines, which for years have experimented with various methods of easing their no-show problem, have not yet accepted the study as being capable of producing results that can be considered reliable or representative. Referred to as a "continuous sampling program," the study was developed by the Air Traffic Conference's reservations committee, and has been conducted by Tom Miles, ATC's director of interline reservations procedures.

It set out to:

• **Evaluate,** to a reliable degree, the actual effect no-shows and other related problems had on revenues for any given month.

• **Analyze** any trend by comparing current data with historical data.

• **Recognize the need** for continuation of the current no-show curtailment program or any modification thereof.

• **Plan future action** concerning the no-show problem which will be in the best interest of the traveling public and the industry.

The survey, made through approximately 125 offices of 23 airlines for one week each month and covering to date well over two million passengers, turned up some interesting facts.

It showed that in boarding every 1000 passengers:

• **140 seats became available** for re-sale within three hours of departure on account of no-shows, late cancelations, and misconnections. This is 14% of sales demand (seats sold and flown plus seats "lost").

• **14 of these 140 seats** were "lost"—they could have been re-sold to customers on the waiting list if they had been available three hours before departure. This is 1.4% of sales demand.

• **Nine of these 14 seats** were lost because of no-shows. This is 0.9% of sales demand.

New Approach

Thus, the survey has taken a new approach. Normally an airline might say that out of 100 passengers booked, only 90 showed up, so it had 10 no-shows. The survey, on the other hand, establishes the "lost" seat. Just because a passenger no-showed does not, in itself, result in a "lost" seat—he could just as easily have been lost had he canceled. The study concedes that there will always be no-shows, late cancelations and misconnects. But—because of these three factors, *was another passenger prevented from using a seat?*

In other words, a "lost" seat is one that could have been re-sold to wait-list customers if the seat of a no-show, late cancelation, or misconnect had been available at least three hours before departure. A seat was not considered lost when a flight departed with all seats occupied—regardless of the number of no-shows, etc. This, it was explained, was a case where demand exceeds supply. Also, seats were not lost when a flight departed with empty space for which there was no demand—no waiting list (supply exceeding demand).

Typical Examples

Example: 50 passengers booked; only 45 departed on the plane, leaving five empty seats. There were five no-shows, misconnects, and late cancelations. However, there were no wait-list passengers that could have been accommodated if space had been available three hours before departure. Result: no seats lost, despite five empty ones.

Example: 50 passengers booked; 45 depart. There were nine no-shows, etc., but four seats were filled by stand-bys. Two wait-list passengers could have been accommodated if seats had been available within three hours. Result: two seats lost.

The number of seats lost on account of no-shows was determined by taking the percentage relationship of no-shows to total TSBA3 (total seats becoming available for re-sale within three hours of departure because of no-shows, late cancelations, misconnects). This percentage was applied to total seats lost on account of TSBA3.

• **On first-class service,** the survey showed that in the first three months of 1953, seats lost on account of no-shows amounted to 7/10 of 1% (0.7%) of passengers boarded. Second quarter was 0.9% and the month of July (latest available) 0.89%.

• **Coach was higher**—0.94% in the first quarter, 1.1% in the second, 1.2% in July.

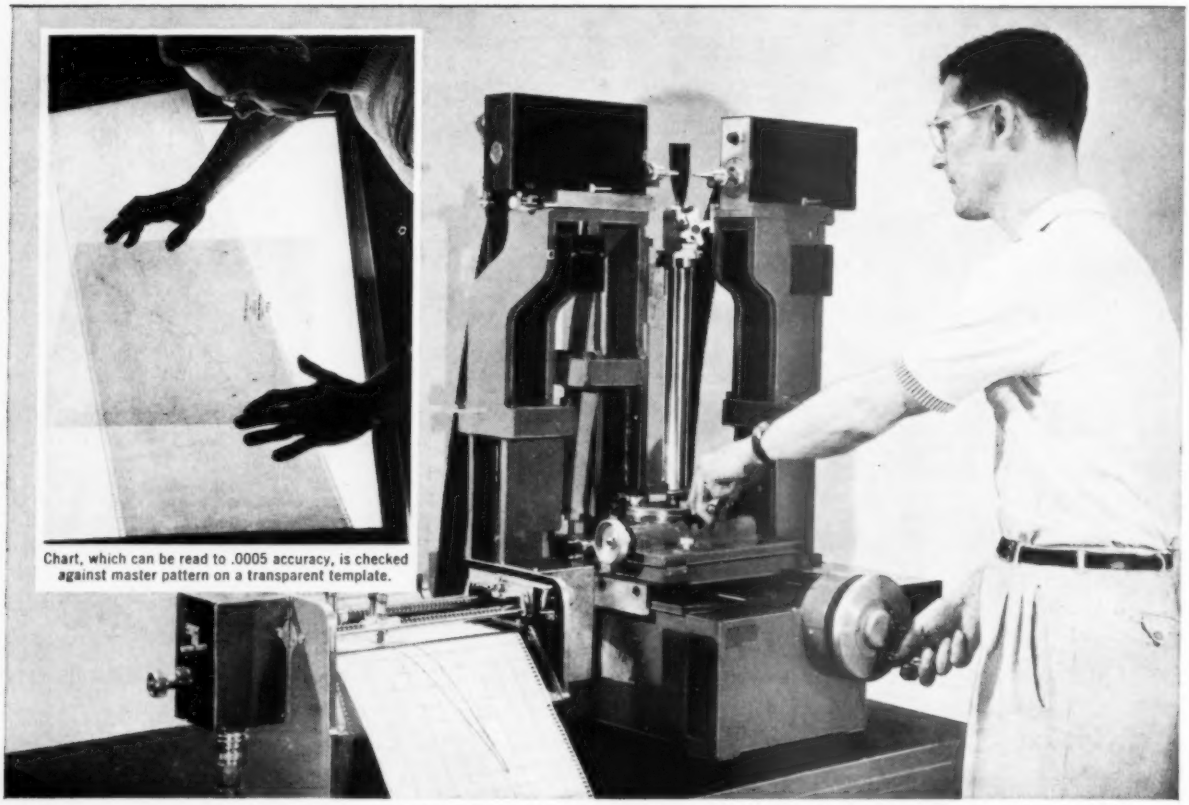
The higher percentage on coach is believed to be due to the fact that demand for this service is closer to being equal to supply than is demand on first-class. In other words, if an agent had had the seats of 20 no-shows, etc., available three hours before departure, he could have sold them all. However, many of these seats were "lost" because they weren't available in time. On the other hand, had 20 first-class seats opened up, he could not have used them all because there were not that many people on the waiting list.

If the study's approach to the problem is accepted, it means that seats lost on account of no-shows amount to less than one per cent of passengers boarded.

This raises important questions: should not the airlines accept this low percentage as the *cost of doing business*

Delta-C&S serves the
Golden Triangle of America
This Golden Triangle embraces one of the richest and most progressive regions on earth, site of 45.8% of all new industrial construction and No. 1 vacationland of the nation.
Delta-C&S, a merger of two pioneer airlines, serves this area with a great and growing airfleet—in the friendly spirit of the land. Investigate this Golden Triangle . . . for business and pleasure.
Delta Air Lines, Inc., Operating as
Delta-C&S
AIR LINES
General Offices: Atlanta, Ga.
Serving 59 cities in 6 countries
DETROIT
CHICAGO
NEW YORK
ST. LOUIS
CINCINNATI
MEMPHIS
KNOXVILLE
ATLANTA
DALLAS
FT. WORTH
NEW ORLEANS
HOUSTON
JACKSONVILLE
TAMPA
MIAMI
GULF OF MEXICO
CARIBBEAN SEA
VENEZUELA
KINGSTON
JAMAICA
CIUDAD TRUJILLO
DOMINICAN REPUBLIC
SAN JUAN
PUERTO RICO
PORT AU PRINCE
HAITI
HAVANA
CUBA
CARACAS

ANOTHER REASON ALLISON LEADS IN THE AIR



Chart, which can be read to .0005 accuracy, is checked against master pattern on a transparent template.

Electronic recording machine traces blade outline on finely graduated chart paper, 10 or 20 times actual blade size, which permits variations to be visually detected.

How we broke a bottleneck

in turbine blade inspection

Five years ago, inspection of turbine blade contours required time-consuming surface plate layouts. Then Allison engineers came up with an idea for a machine which would do more precise checking – one which would trace blade contours at several levels – and automatically record each profile, magnified 10 to 20 times, on charts for easy comparison with a master template.

Here you see the latest machine, built by Allison and General Motors Research Divisions. It is equipped with newly developed electronic tracer heads. This feature enables us to inspect any type of compressor or turbine blade profile without danger of scratching the surface. And by coating plastic patterns with a thin metallic paint, we can also check them for exactness before blades are cast.

Here is another example of Allison and General Motors engineering ingenuity that pays off in more dependable jet performance and lower cost manufacture—typical of the continuous pioneering which maintains leadership for Allison engines in the air.

GM
GENERAL MOTORS

Allison
DIVISION OF GENERAL MOTORS
INDIANAPOLIS, INDIANA

World's most experienced designer and builder of aircraft turbine engines – *J35 and J71 Axial, J33 Centrifugal Turbo-Jet Engines, T38 and T40 Turbo-Prop Engines*

Why Seats Become Available Before Departure

	1st Quarter	2nd Quarter	May	June	July
FIRST CLASS					
Misconnections	8.3 (1.3*)	6.3 (1.0*)	6.7 (1.1*)	4.9 (0.8*)	5.8 (0.9*)
Late Cancelations	32.5 (5.1*)	25.9 (4.0*)	26.5 (4.2*)	23.8 (3.6*)	25.7 (3.9*)
Local No-Shows	31.7 (5.0*)	34.7 (5.4*)	34.5 (5.5*)	35.4 (5.4*)	32.7 (5.0*)
Other No-Shows	27.5 (4.4*)	33.1 (5.1*)	32.3 (5.1*)	35.9 (5.5*)	35.8 (5.5*)
TOTAL	94,129 (15.8*)	123,812 (15.5*)	43,384 (15.9*)	42,050 (15.3*)	39,800 (15.3*)
COACH SERVICE					
Misconnections	5.2 (0.62*)	4.3 (0.49*)	3.8 (0.44*)	3.7 (0.4*)	3.9 (0.4*)
Late Cancelations	30.5 (3.7*)	24.2 (2.8*)	26.4 (3.1*)	21.4 (2.5*)	22.4 (2.5*)
Local No-Shows	39.2 (4.7*)	41.3 (4.7*)	42.2 (4.9*)	40.7 (4.8*)	40.8 (4.5*)
Other No-Shows	25.1 (3.0*)	30.2 (3.4*)	27.6 (3.2*)	34.2 (4.0*)	32.9 (3.6*)
TOTAL	13,038 (12.0*)	18,693 (11.4*)	6,091 (11.6*)	7,278 (11.7*)	7,528 (11.0*)

** Determined by computing percentage relationship between (1) seats becoming available for re-sale within three hours of departure on account of the given cause and (2) total sales demand.*

TABLE SHOWS why seats become available for re-sale within three hours of departure.

(inasmuch as a certain number of no-shows can be attributed to "airline error"; seats lost on account of "passenger failure" constitute an even lower percentage). Or should the industry try to find ways and means of reducing this percentage further? Would an elaborate system designed to prevent no-shows be economically justified?

Miles has attached to the survey some observations on possible ways of reducing "lost" seats. They include:

• **Reduce TSBA3:** "It is assumed," he states, "that some members operate on the premise that when supply and demand remain constant, the fewer the number of seats that become available for re-sale within three hours of departure the fewer the number of seats that will be lost."

The reconfirmation rule and "firming" of interline passengers (calling them to make certain they intend to use their space) has reduced the number of seats becoming available for re-sale within three hours of departure—available after the normal demand has subsided, Miles says. Also, the ratio of TSBA3 to sales demand is about 15% for first-class, 11% for coach. This may indicate that the no-show penalty charge on coach is inducing people to cancel undesired space. It may also indicate, Miles adds, that a penalty for first-class merits consideration, if airlines desire to reduce their present loss below 7/10 of one per cent.

• **Increase load factor** by means other than cutting back on scheduled seat-miles. This entails "holding on to" indicated demand so it will be available when seats open up. A well-organized stand-by program can accomplish this, except on short-haul space, where frequency may be limited, alternate service is available, or fast surface transport is available.

• **Decrease load factor**—scheduling more seat-miles. "A lower load factor may yield more profit than a high load factor by virtue of the fact that new revenue is earned through the accommodation of the majority (if not all) of the existing demand—a portion of which is presently being lost—plus the accommodation of additional demand resulting from normal growth. It must be realized that some members do not have the equipment available to schedule additional seat-miles; consequently, the answer to their immediate problem must be found elsewhere."

The survey represents the first new approach to the no-show problem in a number of years. What the reservations committee will do remains to be seen. Some members feel it reveals the problem as being greater than it actually is, while others maintain it is less. But if the committee accepts the findings, all the facts and figures will be available from which to plan future action. • • •

Your next Flight

THE NEXT TIME you travel, treat yourself to a new experience in comfort, attentive service and schedule reliability: fly PAL. You will understand, then, why many experienced travelers choose PAL whenever their itinerary permits. There is a spirit — an atmosphere — of quiet competence and warm hospitality that will make every minute of your journey a pleasant experience.

PAL DC-6B and DC-6 sleeper service spans ¾ of the world between Mexico City and London via the Orient, serving 18 cities and 15 countries.

For information and reservations, consult your Travel Agent.

PAL PHILIPPINE AIR LINES
ROUTE OF THE Orient-Star

MOST IMPORTANT ROOM at United's new Denver base is probably the briefing center, where staff gives management daily run-down on current operations.

Operations Center Pays Off for United

Centralized facility at Denver is designed to keep management both informed and alert.

By Fred S. Hunter

THE Denver operating base of United Air Lines, now housed in up-to-date new quarters at the Colorado capital's mile-high Stapleton Field, might be described as a huge information center because of the reports funneling into it in an unending stream.

It also, however, epitomizes UAL's basic philosophy of centralization in operations. D. F. Magarrell, vice president of transportation services, who is closely identified with operation of the base, puts it this way:

"It keeps management alert. Nothing of any consequence can happen on the airline now without management being fully aware of it. That puts it up to us. It's our fault if we miss the ball."

It was a bold move in 1948 when UAL threw away its Chicago-San Francisco regional chart and fitted 13,250 sprawling route miles into a centralized operation at Denver. There was no industry precedent for the action. As might be expected, it took time for UAL to begin to reap the benefits of the operational reorganization. But if at any time UAL's management entertained any doubts as to the wisdom of the move, they've long been dispelled.

UAL wasn't the industry's biggest money-maker in total dollars in 1952, but it was in earnings per share, where it counts with investors, at $4.03. This must be regarded as a reflection of increased management efficiency gained at least in some part from use of the base's vast storehouse of information.

UAL's 1952 figures show an even more direct gain in operating efficiency in a reduction in costs from 28¢ to 26¢ per available ton-mile. This 6% decrease was achieved at a time when practically all costs were going up.

The new building into which UAL's base recently was moved is ample evidence of the company's conviction it is on the right track in having centralized its operations. It was built by the City of Denver at a cost of approximately $1,284,000, but under an agreement with UAL to lease it for 30 years at a fixed annual rental of $90,000.

UAL has tagged its glass-enclosed briefing room the "room with a 13,250-mile view." On a big wall map, eight feet high and 20 feet wide, lights glow along UAL's Mainline airway. Stroll by at any time and, if you know the code, a glance will tell you if it is raining in Washington or how much trouble the smog is making for pilots at Los Angeles.

Lucite panels, eight feet high and almost as wide, flanking the map, summarize operations and performance daily and weekly. Here again, a glance shows how many DC-6's are undergoing maintenance, how long the passengers on Trip 609 were delayed at Chicago because of congestion at the terminal, and other pertinent details of operations.

The briefing room is designed to start the day. It is set up for an 8:30 a.m. session each day by Larry Straw, the briefing room analyst.

A session reviewing the happenings of the previous day's operations and forecasting and planning for the next 24 hours normally lasts 30 to 40 minutes. Four specialists who are members of departmental teams on 24-hour duty conduct presentations covering: (1) weather; (2) mechanical performance; (3) customer service; (4) flight operations.

Executives attending these start-of-the-day briefings come from transportation services, passenger service, ground services, passenger relations, cargo and ramp service, payload control, line maintenance, flight operations, flight dispatch, communications, equipment utilization, safety, economic controls, personnel, sales, finance, and property.

Having heard what happened in the last 24 hours, with particular emphasis on anything that may have gone wrong, and having heard the predictions for the next 24 hours, with particular emphasis on weak spots, department heads and section chiefs return to their own desks with a pretty good idea of what should get first attention from their own staffs.

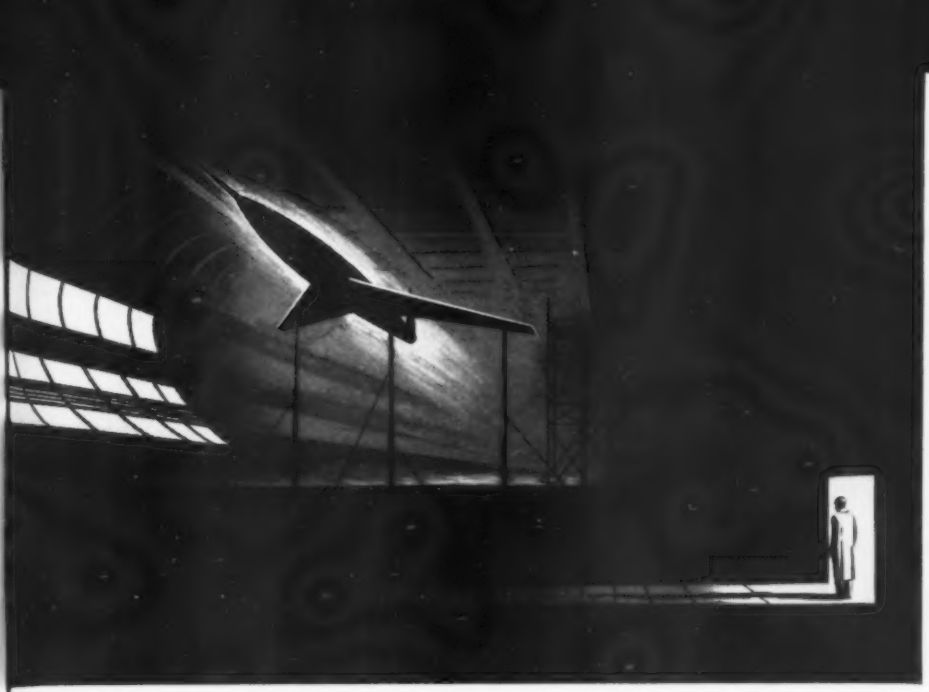
Two UAL vice presidents, D. F. Magarrell and D. R. Petty (vice president of flight operations), make their headquarters in Denver. The only time they ever miss a briefing session is when they are out of town.

Let's take an example, a simple one. Let's say a schedule en route westbound to Seattle has to be cancelled at Salt Lake City because of a mechanical. The hour is 4 a.m. Of 46 passengers aboard, 16 are connections with Pacific Northern Airlines to Alaska.

It's axiomatic that trouble almost never occurs during the regular business day, but invariably waits until an odd hour when there's not a vice president to be found. To safeguard against this sort of thing UAL has created a new group of administrative positions in Denver. Action on an irregularity out on the line at 4 a.m. is just as prompt and as authoritative as at 4 p.m.

UAL's director of flight dispatch is E. P. Lott, long-time pilot and airline operations executive, who is based in Denver. Under him in the Base Flight Dispatch office, which is separate and distinct from the line dispatch office in Denver, come Ray Gohr, Thomas M. Plunkett, Fred L. Gau, A. Z. Gruich, and Gentry Stuart, each with the title of flight dispatch manager, and functioning with equal authority on rotating shifts around-the-clock. All are long experienced in administering airline operations matters.

Next door to Base Flight Dispatch is the Payload Control office, headed



To keep pace with the rapid development of faster, higher-performance aircraft, General Electric engineers have developed a . . .

New G-E Flight Control System Designed For Tomorrow's Aircraft

The new General Electric FC5 Flight Control System was developed to meet the stability and flight control requirements of advanced planes which will roll off production lines beginning in 1955.

The FC5 represents new engineering concepts beyond the currently successful G-E systems now installed in the Navy's Chance-Vought F7U-3 Cutlass, Douglas F3D-2 Skyknight, Grumman F9F-5P Panther and Grumman F9F-6P Cougar and the McDonnell F3H Demon.

CAN BE CUSTOM-DESIGNED

The FC5 is a fundamental system concept which can be custom-designed from a family of integrated components. The number of components, and in some cases their actual designs, can be varied to suit specific applications.

Designed to perform a wide range of functions, the FC5 can fulfill the relatively basic requirements of a single axis damper system or the many requirements of a fully automatic relief and maneuvering system including stabilization in all three axes.

RELIABLE AND LIGHTWEIGHT

Reliability and lightweight are only two of the FC5's design features. It will also incorporate 1) automatic pitch trim 2) "G" limiting in automatic modes of operation to prevent overstress of the aircraft during maneuvers 3) continuous synchronization of autopilot during manual maneuvers 4) immediate pilot take-over at any time—through the stick and rudder pedals—with no transient in the system. The FC5 also has been designed to operate in conjunction with bombing, fire control, navigation and ground control systems.

FC5 BULLETIN AVAILABLE

The FC5 is another in the long line of G-E products engineered by the men who know the needs of the aviation industry. If you would like more information on the FC5 system, write for bulletin GEA-6039. Section 210-84, General Electric Company, Schenectady 5, N. Y.

You can put your confidence in—

GENERAL ELECTRIC

ENGINEERING SPECIALISTS at G.E. work as a team constantly improving present equipment and outlining future system plans.

RESEARCH FACILITIES include both analog and digital computers for complete analysis of the performance of systems and their components.

FLIGHT TESTING at G.E.'s Flight Test Center, Schenectady, N. Y., keeps new developments abreast of the requirements of higher-performance planes.

G-E AUTOPILOTS are now in operational use in some of the Navy's hot planes and are being installed in a new one—the McDonnell F3H Demon.

GUARANTEED TANK RESEALING FOR EXECUTIVE AIRCRAFT BY

TEMCO

CASE HISTORY: #811-102
CUSTOMER: GENERAL MOTORS CORPORATION
SHIP: LODESTAR N-5113

Complete deseal and reseal of integral fuel tanks by the brush and streamline method (using MMM EC-801 sealant). Job completed in ten work days...one of four Lodestar tank reseals for the same customer, all GUARANTEED.

Check with TEMCO-Greenville NOW on your multi-engine executive aircraft rehabilitation requirements. Comprehensive production-line facilities and extensive military and airline experience assure you of *low cost, rapid schedule* and *expert workmanship.*

From tank-resealing to complete nose-to-tail overhaul, Temco is your best source.

For full details on this case history and information about TEMCO's complete custom rehabilitation service for multi-engine aircraft, write to:

Herrol Bellomy, Gen. Supt., TEMCO Aircraft Corp., Greenville Overhaul Division, Box 1056, Greenville, Texas.

TEMCO AIRCRAFT CORPORATION
DALLAS, TEXAS
Plants at
DALLAS • GARLAND • GREENVILLE

by John S. Brinkman, who has a background of wide experience in reservations and in space control. His assistant is Victor Brown, and two staff assistants, Dean Vogelar on cargo and Walter Brandenberg on office administration, also are widely experienced in this phase of the airline's operations.

Five payload control managers, Bill Walsh, K. Amuck, J. Hope, Bacon Taylor and Lloyd Wattis, provide the 24-hour coverage in this department and coordinate with the flight dispatch managers on economic aspects of the airline's operations.

Now let's return to our hypothetical Salt Lake City-Seattle mixup and assume Art Gruich is the flight dispatch manager on duty and Bill Walsh is bossing payload control.

With offices only a step apart there are no physical handicaps to limit their consultations. Nor are their communications with Salt Lake City and Seattle limited. UAL's 78 cities are connected with the operating base through 13,000 miles of private line telephone circuits and 26,000 miles of leased teletype lines. Both Salt Lake City and Seattle are on a private line circuit devoted to operations. Payload control has its own PLF which also connects Salt Lake City and Seattle with Denver.

1500 Flight Messages

Approximately 1500 flight movement messages a day filter into base dispatch. Gruich knows where every airplane is, both in and out of service, and how it is doing. He's familiar with the weather at every point on the system and what's likely to happen to it as the day progresses. Similarly, Walsh has all the load data at his finger tips on all segments of all flights throughout the system.

In no time at all, Gruich and Walsh between them ascertain how long, if at all, PNA might be willing to wait for the 16 connecting Alaska passengers. If it can't wait, or if the delayed connection is marginal, Seattle will be instructed to go after protecting space.

Following westbound trips on UAL will be checked to determine what might be done about picking up the grounded passengers. A nonstop Denver-Portland trip might be flagged down for a Salt Lake City stop to help relieve the situation. Perhaps the only way to get the 46 passengers out of Salt Lake City is to fly in a relief plane.

How do you find a relief plane in this day of equipment shortages? Perhaps you can consolidate a couple of trips. Gruich and Walsh will know. They'll also know what effect this shift in aircraft will have on subsequent aircraft routing control. They might see how to consolidate an eastbound Convair 340 trip out of Denver with an eastbound DC-6 schedule and divert the Convair to Salt Lake City to pick up the grounded passengers. But what about the Convair's turn-around flight, the westbound flight from, say, Chicago?

This is one of the primary points of strength of centralized control as UAL sees it. In the days before Denver, a dispatcher in Los Angeles, as an example, could never know what might happen in Seattle as an ultimate result of some action he had taken in Los Angeles. But base flight dispatch in Denver, monitoring operations and handling aircraft routing control on a system-wide basis, is able to give full consideration to the cumulative effect of any action it takes.

Probably Gruich and Walsh decide the Convair consolidation would lead only to more trouble. Routing schedule on the now grounded aircraft had been to use it on a southbound flight to San Francisco after it had been serviced following its arrival in Seattle. Can equipment be substituted to provide an on-time departure?

By making two or three transfers of equipment, Gruich and Walsh find they can get this schedule off on time and fill in the gap later in the day by dispatching a ship that's just come out of overhaul in San Francisco up to Seattle as an extra section. But they also made sure the new overhaul would be available to fill out the system's long range aircraft routing pattern.

Station Coordinators

In working out their problem, Gruich and Walsh are given active assistance by the station coordinator. Like the flight dispatch managers and the payload control managers, the station coordinators, who are located at the larger terminals, rotate on shifts around the clock and there are five coordinators to the terminal. His duties are to coordinate load planning, ground service, line maintenance and similar activities at the various terminals with flight base dispatch and payload control at Denver.

In time and dollars saved in the expedited handling of irregularities, UAL figures its Denver operating base pays its way. It also collects a big bonus in improved efficiency in regular operation.

Suppose a shipper in Omaha walks into the office and says he wants to arrange for the shipment of 200 pounds of air freight to New York every Monday, Wednesday, and Friday night.

Before Denver, this shipper would have been advised that UAL would be

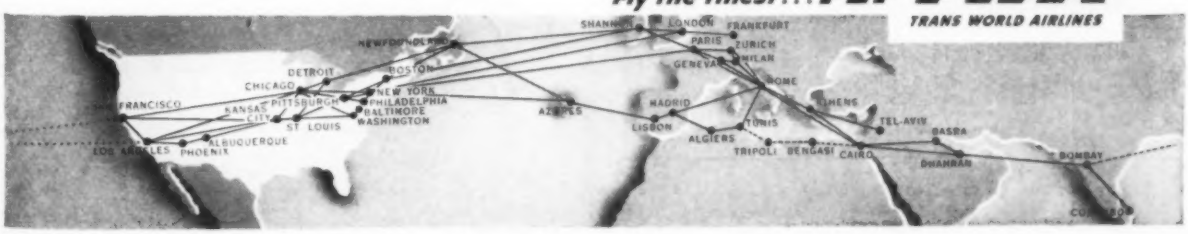
Service with 14,000 smiles

It's in the friendly voice that helps you when you first call TWA . . . in the warm hospitality that gives you a guest-of-honor feeling on TWA's luxurious Constellations . . . and in the bright "good-bye" that matches your spirits as you end a swift, relaxing trip. For TWA's team of 14,000 men and women *all* have your comfort in mind . . . and a spirit of friendly interest in your travel that extends across the world.

Where in the world do you want to go? For information and reservations, call TWA or see your travel agent.

Fly the finest . . . FLY TWA

TRANS WORLD AIRLINES



glad to handle the thrice weekly shipment on a space available basis. First airplane coming through having the space in a cargo pit would take on the 200 pounds and get it started on its way—as far as Chicago at least. If all trips on a particular night were full the freight would have to wait until the next day.

Today Omaha calls Denver on payload control's private line phone. An answer on whether the space for 200 pounds of cargo on the nights in question can be assigned for this particular shipper is forthcoming immediately. The shipper is told right then and there what UAL can do for him . . . and there's no off-loading in Chicago.

In most of its aspects UAL's Denver Operating Base functions in simple fashion. It gets more complicated in payload control. Payload control deals with space and as volumes mount reservations complexities seem to mount progressively.

Advent of the Douglas DC-6, coupled with increases in schedules, pointed out the need for UAL to make over its passenger reservations system. The old system of assigning a certain number of seats on a trip to each station was too cumbersome and too slow. UAL devised the central control mechanism it calls Payload Control to provide better service to passengers and to plan its flights for maximum space utilization.

Payload Control in Denver keeps a master record of all sales. From these records, it can determine the number of seats that have been sold on any flight, or any segment of any flight, anywhere on the system. Thus Payload Control can tell where extra sections can be set up profitably.

From the information sent out by Payload Control, individual stations keep availability records on those trips operating out of or through their stations, plus availability on return flights and on frequently used connections. Large stations like New York, Chicago, Denver, San Francisco, Seattle, and Los Angeles keep complete availability records on all flights throughout the system.

Space sales are reported to Payload Control by the station at which the passengers will board the flight. Early in the game UAL reported each individual sale. Experience taught that this was entirely unnecessary and block reporting could be employed until the last few seats are sold. Now UAL's stations report sales in blocks of five on continuing flights. While this block reporting is going on, the trip remains on open status.

There are exceptions to this procedure. One involves the limitation of sales on a specific segment of a flight. A trip from Chicago to Boston via Cleveland might conceivably be such a popular Chicago-Cleveland schedule that this segment would be so booked up with Cleveland passengers there would almost never be a seat for a Boston passenger. UAL might limit the number of Chicago-Cleveland sales in order to protect passengers wanting to go to Boston.

Instead of reporting in blocks of five, no report is made by an originating station on a nonstop flight until it is within two of selling out. It is then reported to Payload Control as a single block and only the last two seats are reported individually.

For example, Trip 618 is UAL's crack transcontinental, the "Hollywood," operating from Los Angeles to New York with a stop at Chicago. As it makes sales on the Chicago-New York portion of this flight, the Los Angeles office reports the bookings to Payload Control in blocks of five. But it makes no report of sales on the Los Angeles-Chicago portion until it has sold 56 seats, two less than the 58-seat capacity

Engineers

AN INVITATION TO YOU TO GO PLACES WITH FAIRCHILD

Roy W. Lessard, Assistant Chief of Design. Has had extensive aeronautical design and structures experience with many leading aircraft manufacturers and is part of the Fairchild engineering team.

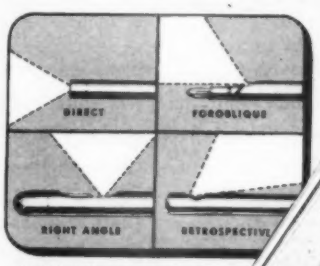
A secure future, exceptional opportunities for advancement, and a high starting salary await you at FAIRCHILD. We have openings right now for qualified engineers and designers in all phases of aircraft manufacturing.

Paid vacations, liberal health and life insurance coverage, 5-day, 40-hour week as a base. Premium is paid when longer work week is scheduled.

ENGINE AND AIRPLANE CORPORATION
FAIRCHILD Aircraft Division
HAGERSTOWN, MARYLAND

A.C.M.I. BORESCOPES

for close-up visual inspection of internal surfaces and hidden parts



A.C.M.I. Borescopes are available in 4 angles of vision (as above)—in diameters of .120" to 4.00"—in lengths of 4" to 720". Special models for special problems.

A.C.M.I. Borescopes permit close-up visual examination of interior areas and surfaces not otherwise visible. They save time and money, and prevent costly dismantling.* Each Borescope is a compact, self-illuminated industrial telescope of highest quality, employing a precision optical system, that produces a flat visual field. Lens systems are fully corrected for color, spherical aberrations, and coma, with all lens surfaces coated to increase light transmission

Write for free informational folder, or tell us your problem.

American Cystoscope Makers, Inc.
1241 LAFAYETTE AVENUE NEW YORK 59, N. Y.

GOODALL FABRICS *fly with the finest*

Major air lines, like all other branches of transportation, rely on Goodall Fabrics for the right balance of luxury and durability. Whether the need of commercial air lines is for upholstery, carpeting, draperies, or coated fabrics... Goodall meets their requirements in every way through the miracle of blending and diversification. For Goodall Fabrics are *Blended-to-Perform*...an investment in long-range economy and lasting beauty.

Where Durability and Luxury are the keynote—
GOODALL FABRICS
are preferred

Goodall-fabrics

© 1953, Goodall Fabrics, Inc., Subsidiary, Goodall-Sanford, Inc. (Sole Makers of World-Famous PALM BEACH* Cloth) *Registered Trade Mark
GOODALL FABRICS, INC. NEW YORK • BOSTON • CHICAGO • DETROIT • SAN FRANCISCO • LOS ANGELES

The Beaver (L.20)

IN SERVICE IN KOREA

OVER TWO YEARS DELIVERIES
ON OR AHEAD OF SCHEDULE

In the past twenty-four months, the de Havilland Aircraft of Canada Ltd. has completed all deliveries to the U.S. Army and Air Force...on or ahead of schedule.

D10A

DESIGNED AND MANUFACTURED BY
THE DE HAVILLAND AIRCRAFT OF CANADA LIMITED
POSTAL STATION "L" TORONTO, ONTARIO

WORLD'S PREMIER AIRPLANE FABRIC

lighter stronger smoother

FLIGHTEX

FLIGHTEX FABRICS, Inc. · 93 WORTH STREET · NEW YORK 13, N. Y.

Leading Manufacturers of Fabric and Tapes for the Aircraft Industry.

FLIGHTEX FABRIC

Export Representative
AVIQUIPO, Inc.
25 Beaver Street, N. Y.
Cable: Aviquipo

of the DC-6B's operated on this flight.

This is because the Los Angeles-Chicago portion is nonstop and there are no intermediate stations requesting protection. This also is why Los Angeles can sell three seats, five seats, seven seats or any number it desires at any one time. But while it can confirm five seats or seven seats from Los Angeles to Chicago it has to stop at three for the Chicago-New York segment and put in a request for the other two or four as the case may be.

Efficiency of a central control depends upon adequate communications facilities. UAL's telephone and telegraph bill for Payload Control amounts to approximately $25,000 a month. In 1952, handling 4,661,780 transactions, it cost UAL $00.0643 per message.

Four Private Circuits

It is estimated 85% to 90% of Payload Control's communications revolve around 28 major stations which are linked to Denver by private line telephone. There are four of these PLF circuits for the exclusive use of Payload Control and they are distinct from other PLF circuits used by UAL's operations and administrative sections. Switching units multiply capacity to 28 conversations at the same time, making it possible to record up to 1032 messages an hour.

Overall average of incoming messages last year was 12,772 transactions per day on the telephone and telegraph. Record number in one day was 16,300.

Telephone messages pouring in on the four primary circuits terminate at a specially designed console manned by two communications controllers. They connect the incoming calls with Dictaphone belt records. The reservations agents out at the stations make their reports in so-called "fast talk," a very rapid, terse telegraphic language.

To show how this goes, let's go back to that Trip 618 from San Francisco to Chicago with stops at Salt Lake City and Denver. An agent calling in from Salt Lake City might say this: "Recorder from SLC post six one eight tenth two DEN." He would mean two seats on Trip 618 of September 10 had been sold from Salt Lake City to Denver."

Shortly after they are recorded, the "fast talk" messages are played back by transcribers who write each reservation on order forms. A register automatically turns up a fresh form. Couriers then distribute the forms to En Route Space or Advance Space Control, depending on the date of a particular reservation. En Route Space Control is concerned with flights of the

current 24 hours; Advance handles everything beyond midnight of any day.

Reservations are listed on control charts, made up for each flight day by day for three months ahead. A glance at the control chart shows how many seats are reserved and how many are open on any flight of any day.

Average time for processing a transaction at Payload Control is 10 to 15 minutes.

The Denver Operating Base also is the location of UAL's statistical production section, of which Jack Murphy is manager. In a way, the base's show place, the briefing room, is a by-product of this department. It is a dramatic presentation of the figures which statistical production runs through its key punch machines and sorters to compile the reports which UAL's management has used so effectively in planning the economies accomplished in operating the airline.

Statistical Report

Let's take a look at a monthly operating report as statistical production compiles it:

It starts off with a page on Activity Trend, which in a nutshell tells what sort of a month the airline experienced. It shows passenger load factors compared to the previous month and the same month last year. It shows the record of on-time performance, the percentage of scheduled miles completed, the percentage of scheduled departures completed and the hours equipment was out of service because of irregularities, in comparison to total fleet hours available. These also are compared with the month before and the year before.

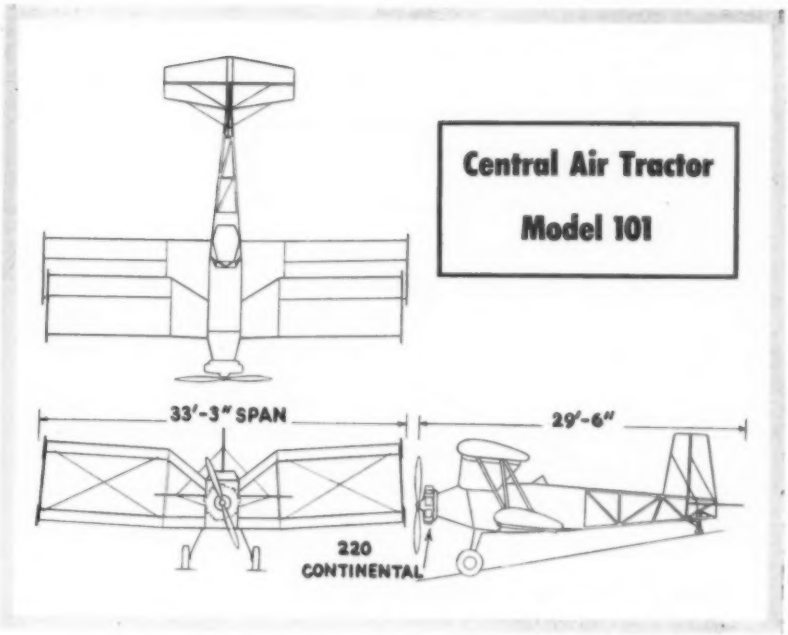
From there on there are 15 pages of detail. There's a report on waiting hours, for example. That tells how much time was lost at maintenance bases, both the overhaul base at San Francisco and the line inspection bases.

Equipment utilization, cancelled departures by cause and type of equipment, ground and in-flight delays, personnel commitments, revenue passengers carried, oversales, irregular out of service maintenance, these are all summed up in the monthly report.

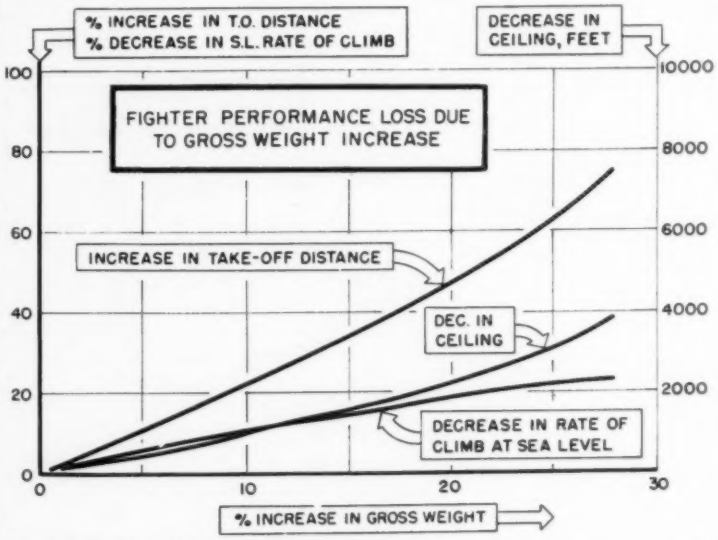
Statistical production operates mainly from extra copies of reports which are made regularly to other departments. When these reports are communicated copies go to statistical production. About 4500 messages a day filter into the section.

All reports for a 24-hour period are processed within three hours after its close. This is the fast information action Don Magarrell was talking about when he said the Denver operating base kept UAL's management alert.

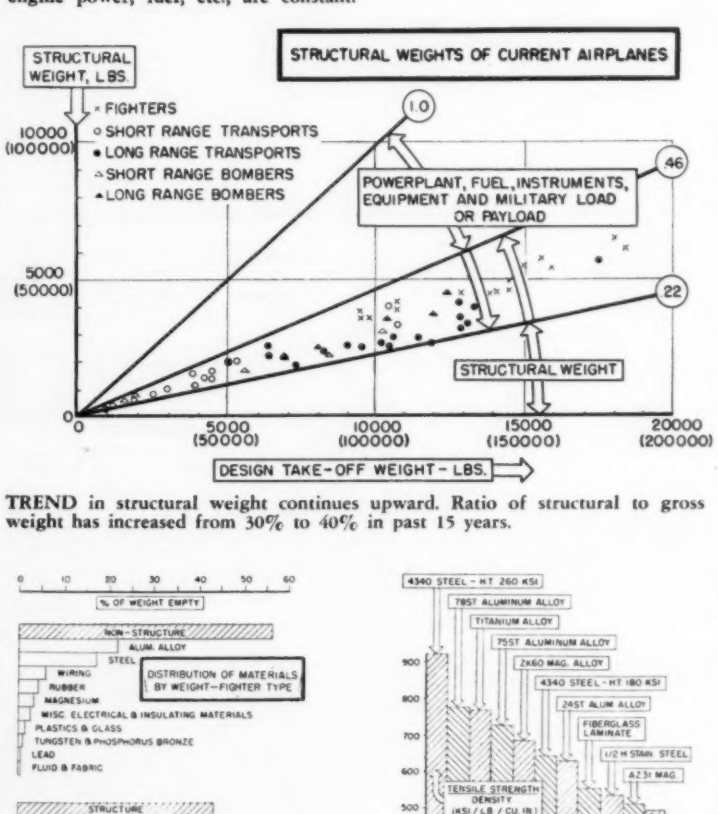
• • •



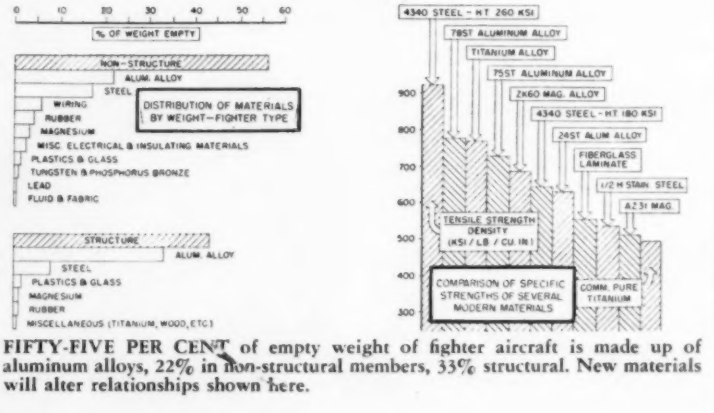
Prototype "Air Tractor," the special dusting and spraying aircraft designed by Central Aircraft of Yakima, Wash., is scheduled to make its first flight sometime this month. "Strictly a farm machine," the "Air Tractor" features interchangeable wing panels and control surfaces; uncovered rear fuselage for easier cleaning of chemicals and improved visibility.



Today's Problem: Weight. Supersonic interceptor performance is heavily penalized by relatively minor increases in gross weight, assuming that engine power, fuel, etc., are constant.



TREND in structural weight continues upward. Ratio of structural to gross weight has increased from 30% to 40% in past 15 years.



FIFTY-FIVE PER CENT of empty weight of fighter aircraft is made up of aluminum alloys, 22% in non-structural members, 33% structural. New materials will alter relationships shown here.

Problems In Structures

THE ATOMIC AGE lying ahead presents both promises and problems for the aircraft structural engineer. Heat released from an atomic bomb overtakes the aircraft that dropped it, subjecting it to thermal stresses that are new to aircraft design. Atomic binding of steel, now foreseen by physicists, would push the strength potential of steel to 29,000 KIPS, as contrasted with 260-900 KIPS for present steels.

These facts represent extremes in both the problems and the promises touched on by two Lockheed Aircraft Corp. engineers in a presentation before the Anglo-American Conference of the Royal Aeronautical Society in London last month. The men were Lockheed vice president Hall Hibbard and chief structures engineer J. F. McBrearty. In a paper titled "Structures for High Speed Aircraft," McBrearty and Hibbard warned:

• **Structural weight,** now representing 30% to over 40% of the aircraft's gross weight, is penalizing all phases of aircraft performance.

• **Aerodynamic heating,** which is not too serious at speeds up to Mach 1, threatens to form a thermal barrier limiting aircraft performance to the same degree that the so-called sonic barrier once did. The temperatures involved (see graph) reduce structural strength, increase corrosion problems, aggravate creepage, distort aerodynamic contours, and cut stiffness of wings to a point where effective control is difficult.

• **Atom-powered aircraft** will present special access problems to permit remote service and maintenance procedures, modified wing stress provisions to account for removal of fuel from the wings and consequent increases in bending loads, more severe bending loads in the fuselage due to heavy crew shielding provisions, and beefed-up landing gears to stand the higher landing weights which result when there is no "fuel consumption" during the flight.

• **Fatigue properties** of some of the newer metals, metals which must be used to meet new structural and thermal requirements, are not as good as the more common metals used today. Under

Multiply Engineering

high cyclic loads they fail earlier than would be indicated by their static properties. New fatigue testing tools, such as the coupon pack with graded stress concentrations which can be bolted to a structural member to integrate load experiences and environmental conditions, may increase know-how in this field.

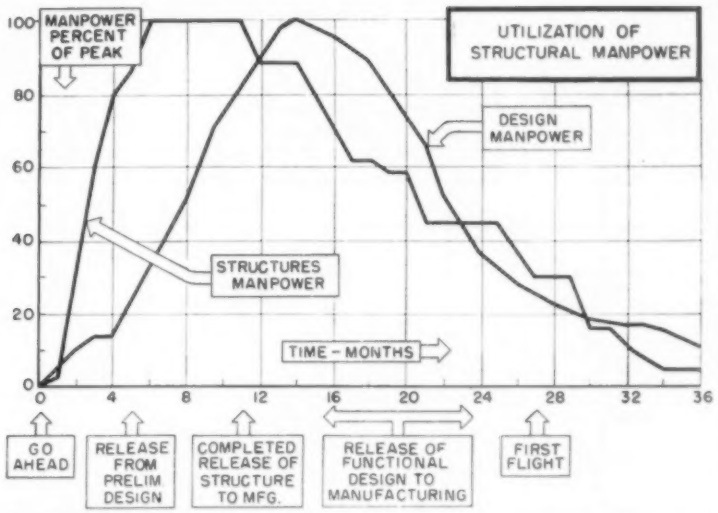
• **Structural rigidity** is becoming a problem in big aircraft. Introduction of higher speeds, thinner wings, stronger materials, etc., has outdated design practices where a structure which was strong enough to carry the load required was usually stiff enough. Aileron loads on today's wings, for instance, can twist the wing to a point where aileron effectiveness is reduced or the ailerons are reversed. Airloads on wings cause wing distortion that alters wing shape and further aggravates the distortion or divergence.

• **Unless engineering specialization** is highly developed, the thousands of variables in today's structural designs can effectively block progress. Wing design of a Lockheed cargo aircraft presented 2400 practical combinations of conditions but an experienced structures group established that only 17 of these required detailed investigation. But unless specialization is spiced with preventative measures, loss of schedule consciousness and project spirit can develop.

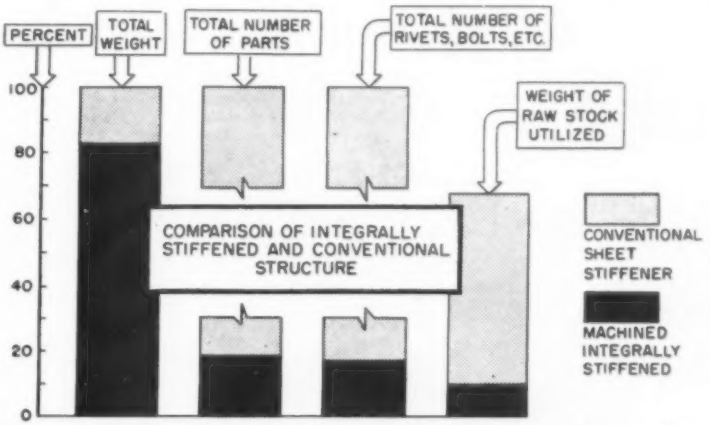
• **78ST aluminum alloy,** which has tensile and compressive properties six to 10% higher than 75ST, and SAE 4340 steel, which Lockheed has worked at tempers up to 260-280,000 psi, show considerable promise of opening new eras of development for the structures engineer.

• **Britain's test method** for pressurized fuselages, in which the test section is submerged in water, is not duplicated in this country. Lockheed, for instance, fills the cabin with large paperboard cylinders and the spaces between them with cast foam plastic "bricks." Small holes in the cylinders bleed air slowly. This method reduces the compressed air volume to workable proportions, is light, inexpensive and has been successful.

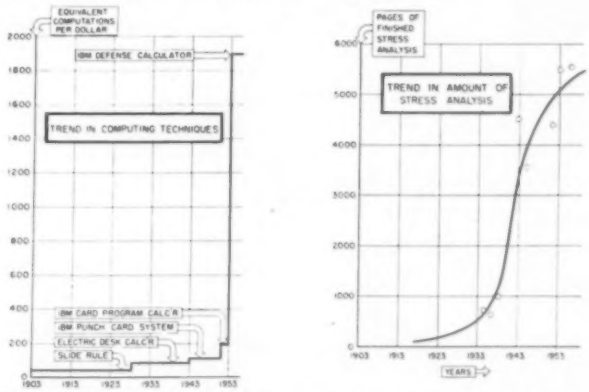
• • •



Some Solutions: Coordination of efforts of structures and design engineers offers room for improvement. Lockheed graph shows ratio of structures engineers to design engineers ranging from 1:2 in early stages of design to 1:20 when plane is in production.

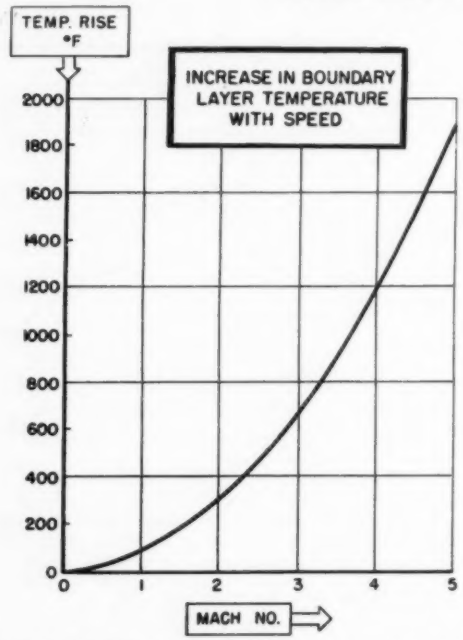


INTEGRAL STIFFENING, as used on inner box beams of Super Constellation, cuts weight by 17%, number of parts by 81%, number of rivets, screws, bolts, etc., by more than 82%, simplifying structural problems.

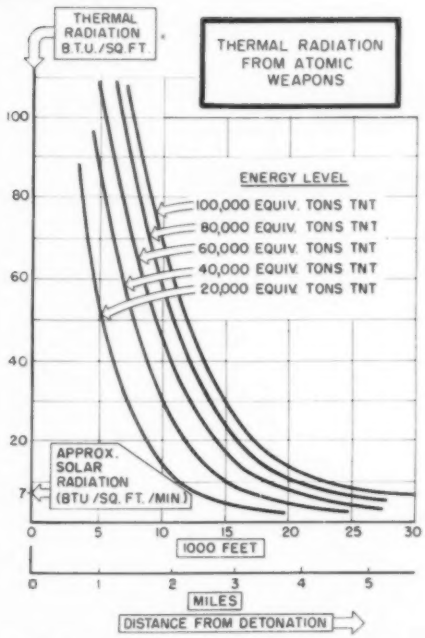


IBM DEFENSE CALCULATOR, introduced this year, will provide engineers with 1800 computations for price formerly paid for 200. Such advances should make possible great strides in design know-how, since some 5500 pages of stress analysis of structures go into current aircraft (see chart at right), each page representing about 16 man-hours.

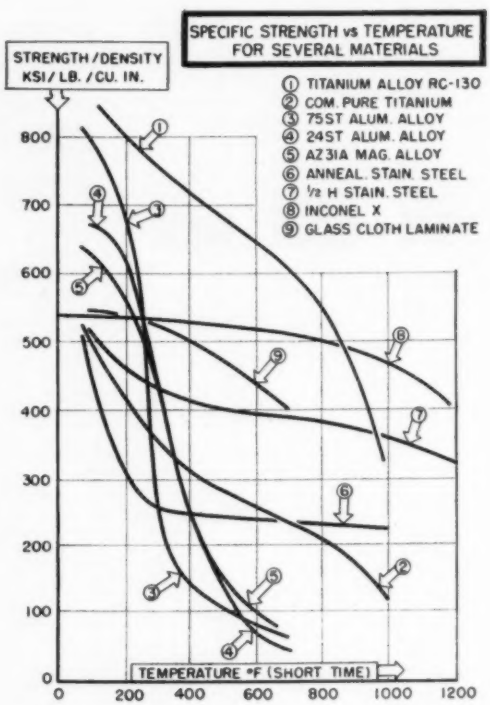
Tomorrow's Problem: Heat



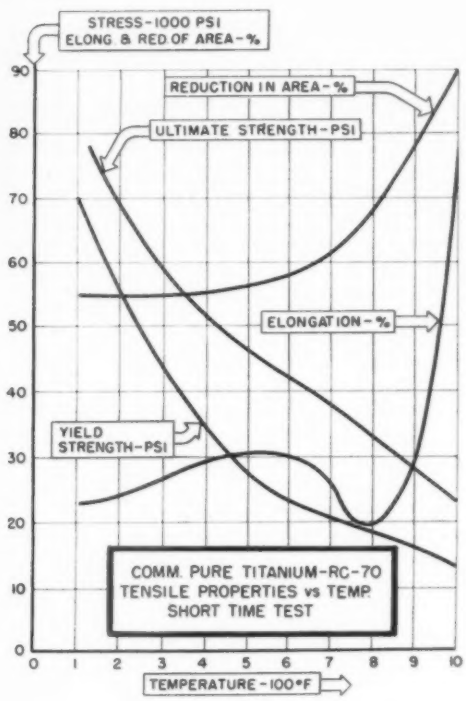
THERMAL BARRIER may prove successor to sonic barrier as principal design problem. Today's boundary layer temperature of Mach 1 is under 100° F., but Mach 2 airplanes now being built must expect 300°.



ATOMIC BOMBING missions expose military aircraft to new hazard of tremendous heat release equivalent to 50 British Thermal Units per square foot up to a mile from the explosion.



TITANIUM ALLOYS are proving the most efficient materials available to accommodate high temperatures in current and proposed jet aircraft while still maintaining good strength characteristics. Note general superiority of titanium alloy (1) in chart.



OVERALL SUPERIORITY of titanium alloy in all the prime characteristics dictating the manner in which it can be used in aircraft structures is plotted here. Titanium's density of 0.16 pounds per cubic inch puts it mid-way between steel and aluminum.

a nose for business

The Chicago Tribune . . . .

One of America's great newspapers was among the first to select the 5-7 place Twin Engine Commander for fast, dependable business transportation.

AERO DESIGN *Commander*

AERO DESIGN AND ENGINEERING COMPANY
TULAKES AIRPORT • OKLAHOMA CITY, OKLA.

DAMAGE INFLICTED on test aircraft as they hit barriers shown at bottom of page included landing gear and propellers ripped off, fuel tanks punctured, fuselage deformed.

Crash Fire Details Released by NACA

Controlled crashes are staged in study of how long occupants have to escape in case of fire.

By WALTER A. KILRAIN

(First of a series of two articles)

A SCHEDULED AIRLINE FLIGHT crash-landed and burned at McChord AFB, Wash., on September 5 after its No. Three and Four engines failed. There were no deaths, but 29 of the 32 people on board were injured. Those who got off so lightly may not have realized how lucky they were. In addition to facing the threat of abrupt deceleration, the passenger in such a crash must face the possibility of fire, toxic gases, flying propeller blades, buckling floors, and collapsing walls.

He is not given much time in which to transform himself from a bystander into an evacuee: if the fire is just outside the fuselage skin beside him, he may have as little as 7½ seconds in which to move away before the skin burns through; after taking this first step he may have less than 50 seconds in which to make his way out of what remains of the airplane.

These figures are extremes, but they are neither fanciful nor arbitrary. They are some of the results of a recent study conducted by the National Advisory Committee for Aeronautics, as described in a report by Gerard J. Pesman.

The NACA took C-46's and C-82's that were no longer of use to the armed services and set them rolling along a rail under their own power toward an embankment. Set into the embankment were barriers designed to wipe off the landing gear, punch holes in the fuel tanks, and give the propellers and engines an opportunity to tear themselves to pieces when the planes hit them at 85 to 95 miles per hour. Instruments inside the aircraft and movie cameras arranged around the crash scene recorded the results.

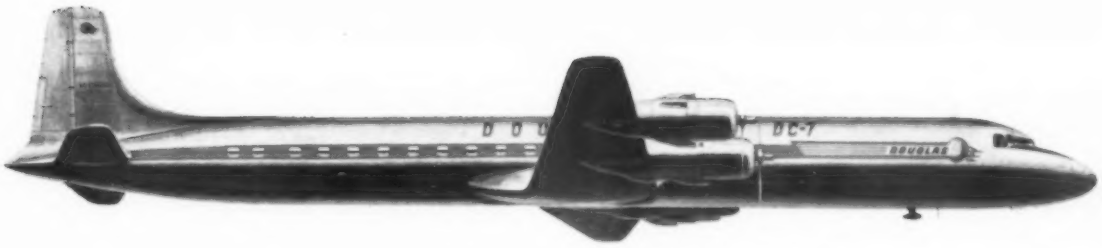
The arrangements were planned to simulate take-off accidents in which there would probably be serious fire, but relatively little structural damage. All the fuel was located in tanks outboard of the engines (in itself a significant limiting factor as far as the general applicability of the results is concerned). On some tests the fuel was standard 100/130 grade aviation gasoline; on others a low volatility fuel having Reid vapor pressure of 0.1 pound per square inch was used.

In some cases fires were built around hulks of planes that had been crashed earlier and had not burned. During these fires it was possible to gather more information than during those that resulted from in-motion tests.

From the series of crashes and the data gathered in them NACA came to some conclusions of importance to both designers and operators:

• **In all but the most severe fires,** the occupants of airplanes like these, in crashes like these, will have a minimum of approximately 50 seconds in which to get out;

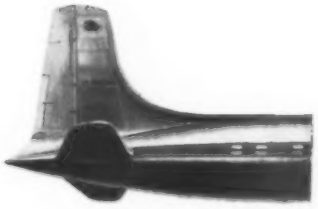
TEST SET-UP included guiding track flanked by concrete runways, embankment with spike-studded poles on top of it, and distant stands for movie cameras.



76 AiRESEARCH UNITS

ON EACH GREAT

NEW DOUGLAS DC-7



Another step forward has been taken in commercial aviation with the advent of the 400 mph DC-7. And as always when new sky frontiers are crossed, AiResearch products are doing a big job as part of the team!

Would you like to work with us?
Qualified engineers, scientists and skilled craftsmen are needed here.

AiResearch Manufacturing Company

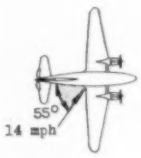
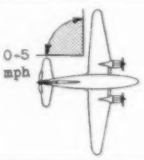
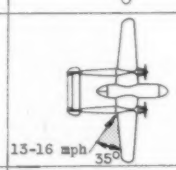
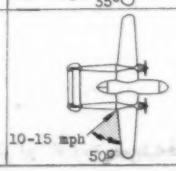
A DIVISION OF THE GARRETT CORPORATION

LOS ANGELES 45, CALIFORNIA • PHOENIX, ARIZONA

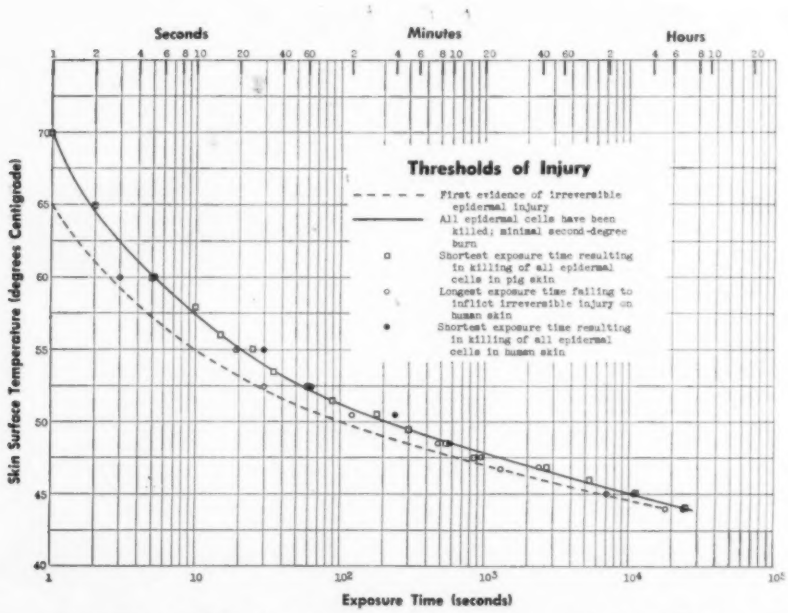
DESIGNER AND MANUFACTURER OF AIRCRAFT EQUIPMENT IN THESE MAJOR CATEGORIES

Air Turbine Refrigeration | Heat Transfer Equipment | Electric Actuators | Gas Turbines | Cabin Superchargers | Pneumatic Power Units | Electronic Controls | Cabin Pressure Controls | Temperature Controls

Escape Times in Four Crashes

Crash	Position in airplane	Severe pain and skin injury begin, sec after impact	Minimal second-degree burn, sec after impact	Respiratory limit (390° F), sec after impact	Airplane	Wind direction and speed	Fuel
1	Left front fuselage	180	224	251	C-46		Gasoline
	Right front fuselage	220	260	292			
	Left rear fuselage	174	306	296			
	Right rear fuselage	163	180	288			
3	Pilot's compartment	182	203	182	C-46		Gasoline
	Front fuselage	92	101	151			
	Rear fuselage	90	100	138			
6	Pilot's compartment	144	150	59	C-82		Gasoline
	Fuselage	53	60	131			
7	Pilot's compartment	93	97	112	C-82		Low-volatility fuel
	Fuselage	92	95	93			

RECORD OF FOUR CRASHES shows effect of varying winds on the two types of aircraft tested. Low volatility fuel gave no significant advantage.


Seconds
Minutes
Hours
Thresholds of Injury
First evidence of irreversible epidermal injury
All epidermal cells have been killed; minimal second-degree burn
Shortest exposure time resulting in killing of all epidermal cells in pig skin
Longest exposure time failing to inflict irreversible injury on human skin
Shortest exposure time resulting in killing of all epidermal cells in human skin
Skin Surface Temperature (degrees Centigrade)
Exposure Time (seconds)

LENGTH OF TIME skin can endure a given temperature before suffering second-degree burns is shown above, as measured for human skin and pigskin.

• **Better insulation,** designed to withstand heat and direct flame, would stretch this time, if it were an efficient flame and gas barrier;

• **Non-melting window panes** are needed to keep flame, smoke, and toxic gases from pouring into the carefully insulated cabin;

• **Fuel tanks far outboard**—as far as possible from the fuselage—would keep the temperatures down in the vicinity of the cabin and leave escape routes open for those passengers who succeed in getting out;

• **Propellers that rotate away from the fuselage** in the lower half of their arcs would have a tendency to sling metal fragments away from the scene of the crash instead of toward it, as is now the case;

• **Low-volatility fuels** are no safeguard when a punctured tank sprays fuel into the air in the form of mist; under these conditions such fuel burns just as fast and hot as any other type. Its safety features show up only when it flows out of the tanks in liquid form;

• **Crews can increase the odds** in favor of passenger survival by suggesting that drapes, rugs, blankets, etc., be used as shields in front of the passengers' faces when making an escape. They can also be used to grasp emergency exit handles which otherwise may be too hot to touch.

The last point may be as vital as any, for in a crash fire the pain produced by the heat may panic the victims, slowing their escape efforts and exposing them to more heat and more pain. Pain, not injury, was therefore used as the standard by which the factors involved in a crash were evaluated. The "escape time," which was the target figure in each experiment, was defined as the interval during which the occupants could make effective efforts to escape; it was not the time during which they would remain alive.

Tests have shown that when the temperature of the skin reaches 42° to 45° Centrigrade (five to eight degrees above normal body temperature) the pain is "unbearable." This is also the temperature level at which second degree burns occur. Below 44° C. the skin cells can repair the damage as fast as it occurs; above that point injury to the tissues becomes progressively worse.

A skin temperature of approximately 44° can thus be taken as determining escape time, both from the point of view of pain and second degree burns.

At this temperature, a period of six hours would be necessary before a second-degree burn would be produced. At 55°, however, 20 seconds will be enough to produce such a

burn, and at 70° C. (158° F.) the injury will be inflicted in one second (see graph on page 44).

What happens to the respiratory system when the crash victim breathes hot gases while trying to escape? The tests show that while the respiratory system can stand higher ambient temperatures than the skin can be allowed to reach, the difference in escape time is so small that to provide safeguards against one threat without taking adequate precautions against the other would be a waste of effort.

The exact point at which injury is inflicted upon the respiratory system is not known, but the NACA picked 390° F. ambient temperature as an arbitrary threshold, since this is the highest temperature to which the human respiratory system is known to have been exposed without injury. Though this seems well above the limit for pain or second degree burns, the temperatures in these crashes rose rapidly, and the respiratory limit was consequently reached soon after the skin-burning limit.

In one case (the pilot's compartment in Crash Six) hot gases were carried into the area by wind and convection, so that the respiratory limit was actually reached before the crew would have suffered second degree burns on their hands and faces.

(To be continued.) • • •

Hughes Aircraft Beset by Troubles

Hughes Aircraft Co. has been having its share of troubles:

• **Two more top officials** quit the radar, missile, and electronics manufacturer and others were rumored ready to step out in a management row. Gen. Harold George, v.p. and general manager, and his assistant, C. B. (Tex) Thornton, both resigned, following in the footsteps of Dr. S. Ramo, former v.p. for operations, and Dr. Dean Wooldridge, former v.p. and director of the research and development laboratories.

The latter two formed a new corporation, devoted to research, development, and manufacture in advanced electronics and guided missiles, known as Ramo Wooldridge Corp. (AMERICAN AVIATION, Sept. 28). The new group will be financed by Thompson Products, Inc.

There was talk that Dr. R. P. Johnson, Wooldridge's aide, and R. B. Parkhurst, plant manager for electronics, had also given owner Howard Hughes notice. But Hughes told his 17,000 workers that "only four have left" and his best information, "which I believe to be more accurate than any other available," indicated "no one else intends to leave the company at this time."

• **The Air Force stopped development work** on the Hughes jet-powered XH-17 "flying crane" helicopter because of "Army budget considerations." A larger version of the vehicle, the XH-28, was also believed eliminated by the contract cancellation.

• **Just as Hughes was preparing** to begin taxi and flight tests on the mammoth HK-1 flying boat (new R-4360 engines had been installed), an earth dike on a piece of nearby property burst and flooded the aircraft with mud and silt, doing extensive damage. Officials estimated it would take more than a year to repair the $5 million damage to the HK-1. Nearly $45 million has now been invested on the plane, about $18 million supplied by the Reconstruction Finance Corp., which holds title.

• **Goslin Corp. filed a $7.8 million suit** against Hughes Aircraft in Los Angeles Superior Court, alleging Hughes violated an oral agreement and permitted other firms access to Goslin transformers, reactors, and other devices.

Facts and Figures!..

Figure:

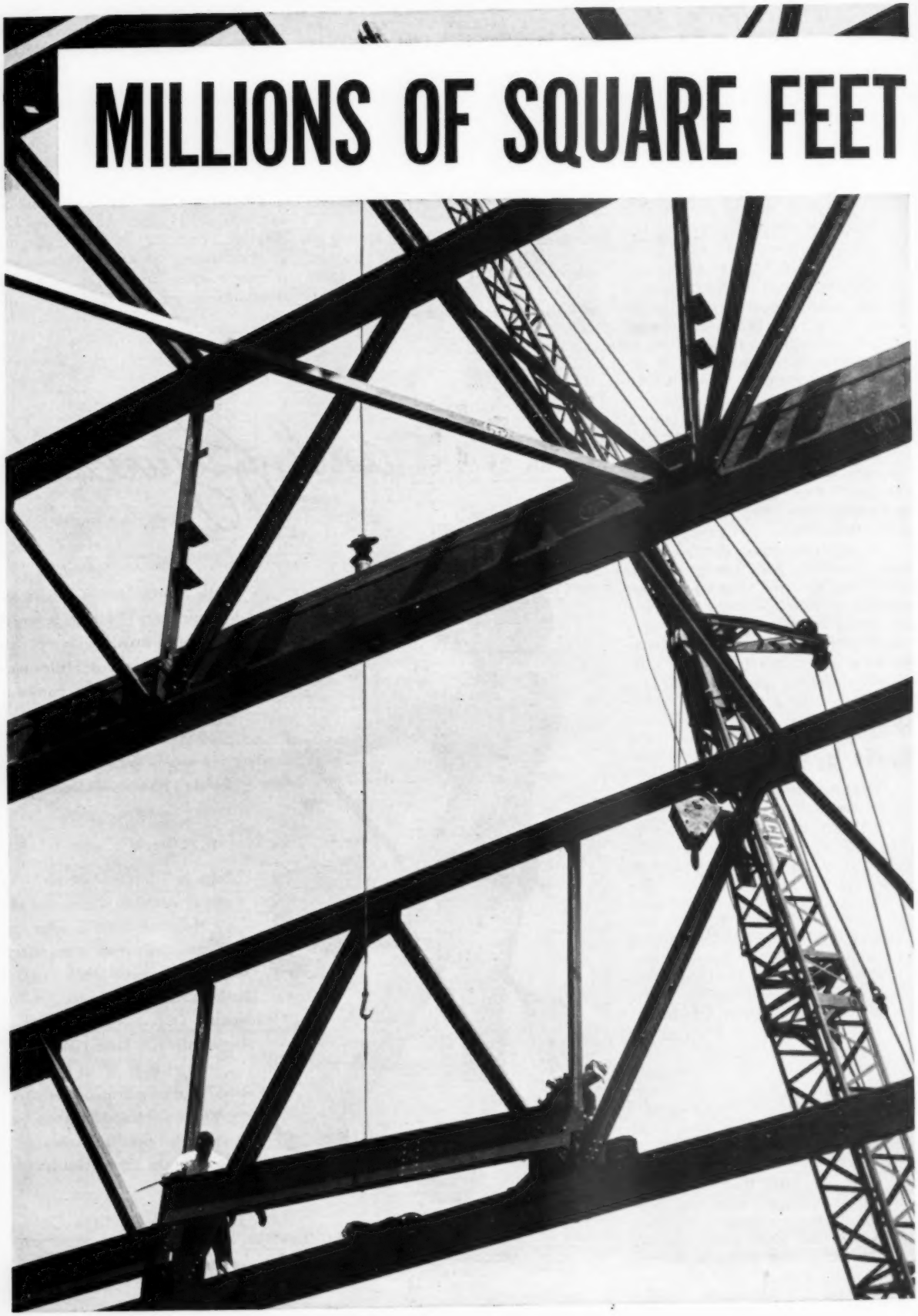
50th Anniversary of Flight or no 50th Anniversary of Flight, femmes in funnel-fitted millinery for centuries have celebrated Halloween doing Lazy 8s and spins, powered only by supersonic broomsticks. Coming in for a neat 3-point landing is Sally Taylor, 17, 5'4", 120 lbs., blue eyes, blonde hair.

Fact:

Pratt & Whitney Aircraft — a proud name in the history of powered flight — joins its distributor, Southwest Airmotive, in staging a fact-packed Engine Maintenance & Operation Forum Wednesday, Oct. 14, in our newly-enlarged plant at Love Field. SAC salutes P. & W. as a unique pace-setter in thusly bringing factory know-how to pilots and maintenance men assembled here from throughout the Flying Southland!

Southwest Airmotive COMPANY
LOVE FIELD | DALLAS

MILLIONS OF SQUARE FEET



TO BUILD NEW TURBOJETS

In one sense, at least, the last six years of hard work at Pratt & Whitney Aircraft have been only preparatory.

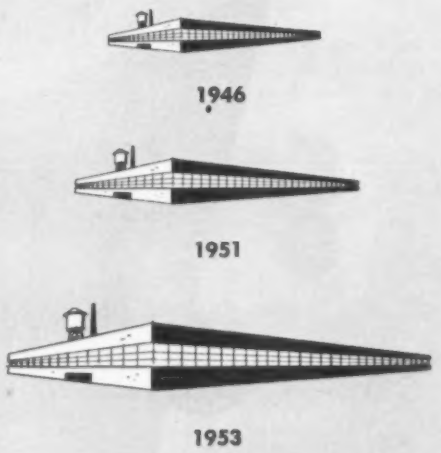
While we have increased output of both jet and piston engines, we have been building and expanding our plant, preparing for one of the most important engine programs in our long manufacturing history.

Today this company-financed plant expansion is almost complete. Production of gas turbine engines in the highest power category is accelerating rapidly to meet the urgent requirements of National Defense. In fact, this year for the first time, Pratt & Whitney Aircraft will produce more engine horsepower in turbojets than in piston engines.

But it has been a big job, building brick and mortar facilities for our growing turbojet program, and tooling up these facilities with the wide variety of equipment needed for jet engine production. At the same time we have had to keep increasing our production of piston engines for the armed forces and for civil aviation.

Beginning in 1947, extensive jet research, development and test structures were built. In 1950 the Navy stand-by plant at Southington was reopened, and the next year, Meriden was leased and put into operation. These two branch plants, plus a number of smaller facilities, totaled more than a million square feet. In 1952 our new North Haven plant was finished and occupied, and substantial additions were made at East Hartford. Pratt & Whitney Aircraft's *manufacturing areas alone* now total more than 4,000,000 square feet.

Yes, it has taken years of hard work to fully expand our plant for the new engine programs. But our new facilities are nearly complete and we are concentrating on the major work ahead—increasing production of our turbojet engines. We are proud of the important part the J-57 and other Pratt & Whitney Aircraft engines are playing in helping to keep America's airpower strong.



THE ABOVE CHART illustrates the huge increase in plant facilities at Pratt & Whitney Aircraft . . . from the immediate postwar period, when our turbojet work began, to the present total of over 6,000,000 square feet. Approximately four-fifths of that total is company-built and company-owned, representing an investment of many millions of dollars in the continuing development of dependable aircraft engines.

Pratt & Whitney Aircraft

MAIN OFFICE AND PLANT: EAST HARTFORD, CONNECTICUT
BRANCH PLANTS: NORTH HAVEN, SOUTHINGTON, MERIDEN

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

SEEING IS BELIEVING

Supplying the right answers to pilots and navigators by means of accurate, reliable instruments has been our work for more than twenty-four years.

- AIRCRAFT INSTRUMENTS AND CONTROLS
- OPTICAL PARTS AND DEVICES
- MINIATURE AC MOTORS
- RADIO COMMUNICATIONS AND NAVIGATION EQUIPMENT

Current production is largely destined for our defense forces; but our research facilities, our skills and talents, are available to scientists seeking solutions to instrumentation and control problems.

kollsman INSTRUMENT CORP.

ELMHURST, NEW YORK • GLENDALE, CALIFORNIA • SUBSIDIARY OF Standard COIL PRODUCTS CO., INC.

Books

THE MARS PROJECT *by Wernher von Braun. University of Illinois Press, Urbana, Ill. 91 pages; $3.95.*

As soberly and methodically as an airline operations man figuring the balance of fuel and payload between Chicago and L. A., Dr. von Braun in this brief book has set down what we will need in order to fly to Mars.

This is a book for calculation rather than for reading. With the exception of the introduction, in which the author outlines his plan, it consists almost entirely of tables, diagrams, and the formulae from which they were evolved. It is a book which plunges abruptly into realms where only the engineer and his colleagues will be likely to follow, leaving the lay reader to make what he can of the general ideas involved.

Among the more intriguing of these:

• **The trip to Mars** had best be made on a grand scale: 10 space ships; 3 smaller "landing boats"; 46 ferry vessels to be used in assembling the space ships at some satellite station in an orbit around the earth, by means of some 950 ferry flights; a crew of 70.

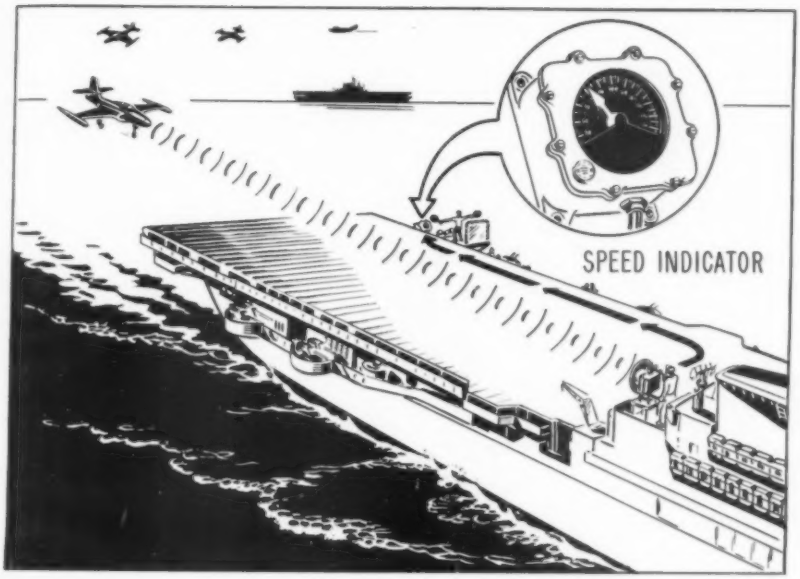
• **The 10 space ships themselves** will never touch either Earth or Mars. Assembled in an orbit around Earth during the eight months of ferry flights, they will fly to Mars and then circle for 449 days while the scientists (except for an unfortunate "housekeeping" crew left in the big ships) descend to explore the planet in the small winged landing boats. Upon returning to their old orbit around Earth, the crews will descend to terra firma by means of the ferry ships. Total time: two years, 239 days.

• **Since streamlining is pointless** in a vacuum, the space ship von Braun conceives would be composed of an ungainly collection of fuel tanks with a spherical crew compartment in the front and a nest of rocket nozzles in the rear. It should closely resemble a chemical tank farm set adrift. Each set of tanks would contain the fuel allotted for a certain stage of the trip; as the fuel was consumed, the tanks would be jettisoned.

• **Since the "weight" of the fuel** (hydrazine and nitric acid) and the stresses involved will both be small, the tanks (and the fuselage too) can be made of thin, nylon-reinforced plastic. This not only saves weight, but also makes it possible to carry these sections up into the departure orbit in a collapsed condition, saving valuable space on the ferry flights.

There are a great many questions about a flight to Mars which von Braun does not attempt to deal with: this is not a handbook on how to do it; it is a preliminary study designed to prove that it can be done and with what equipment. Such questions as just how the ferry rockets and the space ships will be developed are details to be dealt with in due course. The basic fact, von Braun feels, is that we are not deceiving ourselves when we talk of the trip as a possibility. The logistic requirements? "No greater than those for a minor military expedition extending over a limited theater of war."

. . . WK



Echoes rebound off plane and are picked up again by Navy radar antenna now in use on carriers, serving as basis for Raytheon's new speed indicator to compute plane's true airspeed. Radar waves are trained on jet plane as it comes in for landing on carrier deck.

Radar Gauges Speeds For Carrier Landings

Dish-shaped microwave radar antenna tracks incoming plane. Crewman points it toward plane, as part of operation of speed-indicating device.

Wig-wag flags guide jet pilot to safe landing, as low-mounted dial of speed indicator aids in determining whether approaching plane is coming in too fast or too slow.

A MILITARY COMMENTARY . . .

How Do You Get More for Less?

SEN. STUART SYMINGTON (D., Mo.), former Secretary of the Air Force, addressing the AFL Convention in St. Louis Sept. 22, warned that Administration aircraft cutbacks are causing the U.S. to fall steadily behind the Russian airpower buildup.

During the hearings on the defense budget, he said, Secretary of Defense Wilson and his spokesmen said "over and over again" that no combat planes were being eliminated. Symington pointed out that since Congress adjourned, 965 planes, including 748 combat aircraft, were eliminated from the USAF program. He gave the value of the eliminated combat planes estimated at over half a billion, and the subsequent engine cancellations at hundreds of millions.

Symington also charged that the cutbacks were not really initiated by the Air Force itself and that the new cutback "is a direct result" of the Administration's reduced Air Force budget. "This new cutback," he added, "must be credited to the Department of Defense. Its leaders cannot hide from their responsibility."

The whole pattern of operation is clear, Symington said.

"First cut the pilots and mechanics, and get away with it by saying you do not plan to cut out any combat planes. Then, after the Congress adjourns, in that there is no need for planes without pilots, cut the combat planes. Then, because you heavily cut the planes you have no need for thousands of engines—so cut the engines—and by the time the Congress gets back it will all be accomplished." Symington termed the process "an ingenious method of cutback by manipulation."

The Missourian said he was convinced the Congress would not have voted this year's reductions in the defense budget "because many Senators told me they were voting for the cut as a result of the Administration's pledge that no combat planes were being cut. . . . Now the truth is there for all to see."

Who are the men actually responsible for these cutbacks? Senator Symington charges that the cutbacks were not really initiated by the Air Force itself, but "must be credited to the Department of Defense." So, who are in the Department of Defense, and what are their backgrounds? Do any of them have an Air Force background? In short, does any single one of them have any actual practical knowledge of the USAF?

The answer is that there is not one with such knowledge. All they know about airpower is what they read in the papers.

Let's glance down the list of these Lord High Executioners of American airpower. First we have Charles E. Wilson, Secretary of Defense and former head of General Motors—no military service and knowledge of airpower confined solely to an understanding of how General Motors manufactures planes and engines, but not how they are used in combat. Roger M. Kyes, Deputy Secretary of Defense, also is a General Motor graduate with no military service.

Among the nine Assistant Secretaries of Defense we have three with civilian backgrounds, three with Army backgrounds, and three with Navy backgrounds. We have:

Franklin G. Flote, Property and Installations—Army.
Melvin A. Casberg, Health and Medical—Army Medical.
Donald A. Quarles, Research and Development—Army.
Charles S. Thomas, Supply and Logistics—Navy.
Frank C. Nash, Internal Security—Navy.
Wilfred J. McNeil, Comptroller—Navy.
Frank D. Newbury, Applications & Engineering—no military service.
John A. Hannah, Manpower & Personnel—no military service.
Frederick A. Seaton, Legislative Affairs—no military service.

So that's the Department of Defense civilian team—The Nine Old Men, the Assistant Secretaries for this, that, and the other, with Charles Wilson as manager.

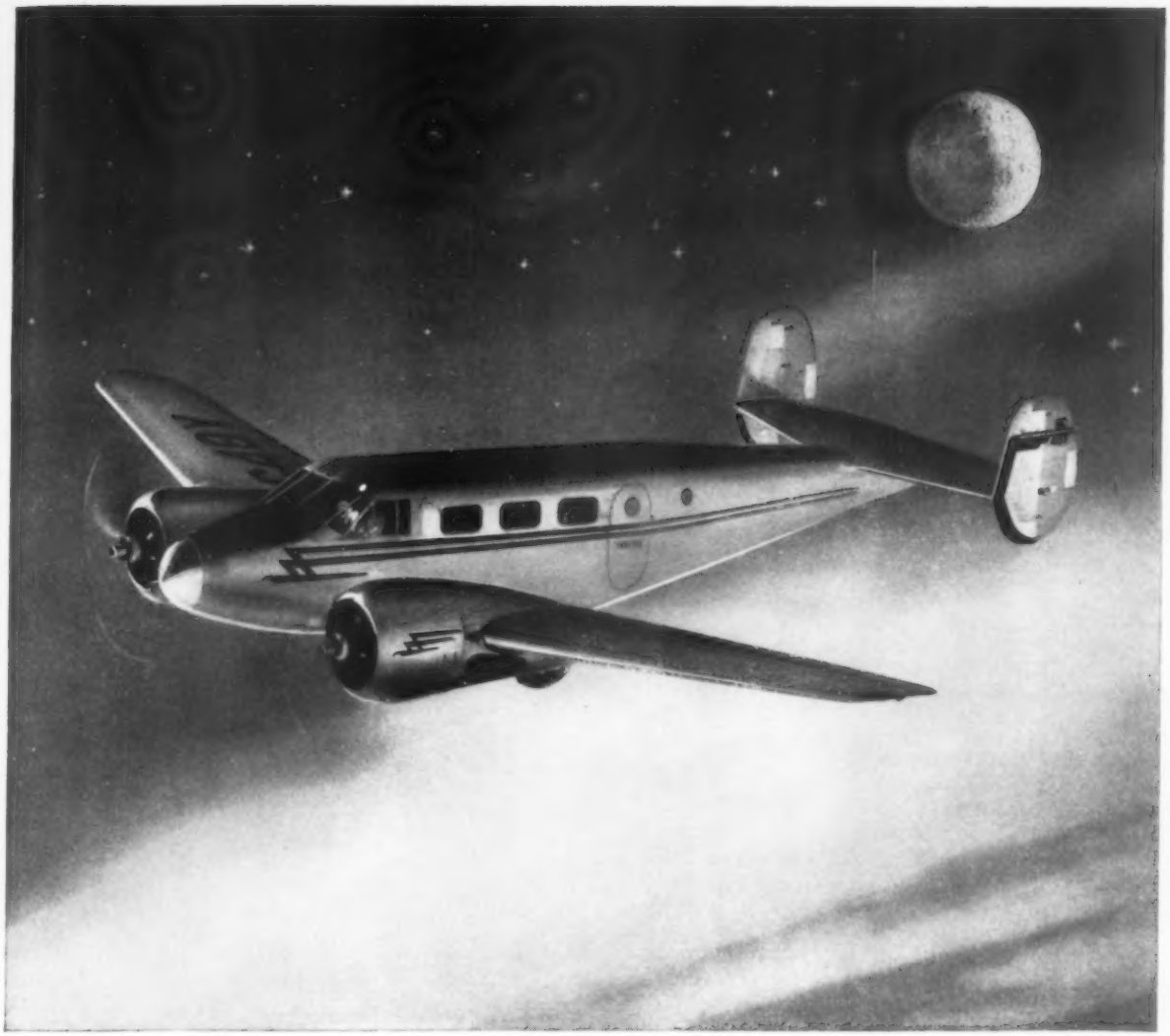
From their backgrounds, it would appear fair to assume that the three Navy members would favor Navy; the three Army men would favor Army; while the three civilian members—who may be considered neutral so far as Army, Navy and Air Force are concerned—don't know a damn thing about American air power, other than the smattering of knowledge they may have gleaned casually from the newspapers before they turned to the sport pages and the comics.

Above these worthies loom the imposing figures of the Chairman of the Joint Chiefs of Staff—an Admiral, and President Dwight D. Eisenhower—an Army general. They are men of high honor and intelligence, and there can be no doubt whatever they would lean over backward to be fair and impartial in their thinking about the armed services—and which service should be cut most deeply in this age of economy when we apparently must weaken our defenses in order to finance our six-billion-dollar foreign give-away program.

But can the leopard change his spots? Can Admiral Arthur Radford, at this late date, reverse all his thinking about bombers and aircraft carriers—and advocate more SAC bombers and fewer super carriers? And can President Eisenhower discard his lifelong belief that the infantry is the Queen of Battles?

Those are the $64 questions. Anybody got answers?

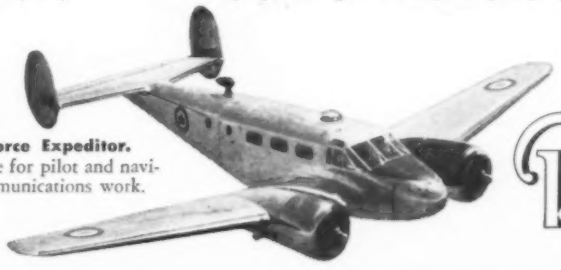
. . . CY CALDWELL



This plane flies to the moon and back . . every day

Hundreds of rugged, dependable Beechcraft "Twins" serve business all year long. It's estimated that these company-owned Beechcraft Executive Transports fly a combined distance equal to a trip to the moon and back every day.

Management men rely on this soundproofed, superbly comfortable plane for the best of reasons: Its *use* saves them *money,* cuts travel-time as much as 75 per cent. These men take field trips they formerly "passed up"—coming and going at *their* convenience. They personally sell distant customers, solve problems on the spot. Investigate. Typical costs, operating data on request from your Beechcraft distributor or write Beech Aircraft Corporation, Wichita, Kansas, U.S.A



Royal Canadian Air Force Expeditor. Beech "Twins" will serve for pilot and navigation training, and communications work.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

TOMORROW'S AIRCRAFT: One step closer
Larger wind tunnels
for full-scale testing
of supersonic craft

The largest rotating system in the world is now being built by Westinghouse for installation in the United States Air Force, Arnold Engineering Development Center's Propulsion Wind Tunnel at Tullahoma, Tennessee. This giant wind tunnel will accelerate the full-scale testing of turbo- and ram-jet aircraft engines as well as components of planes and missiles, in the 2000-mph range . . . well into the supersonic speeds of tomorrow's air age.

Westinghouse applied a new concept in wind tunnel engineering by designing a single axial flow compressor to feed both the transonic and supersonic tunnels from a single drive shaft. Most powerful of its kind ever built, it uses four motors in tandem—delivering over 200,000 hp to drive five giant compressors whose full output is translated into wind speed. This single-unit system is an imposing spectacle of man-made machinery, barely suggested by its over-all length of 575 feet and 7000 tons of weight!

Thus, Westinghouse creative engineering and productive skill are assisting the U. S. Air Force in providing a facility which will simulate flight under a wide range of transonic and supersonic conditions, greatly expanding the horizons of aircraft and missile development. And the experience and ability devoted to such an installation demonstrate once again the unique capabilities in the wind tunnel field . . . all paving the way for new research beyond today's barriers, basic to continued military and commercial air leadership. Proving, above all else, that you should look to Westinghouse when you have a problem in aviation. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-91008

Above is an artist's sketch of Propulsion Wind Tunnel in which Westinghouse's 200,000-hp driven compressors will create supersonic speeds. Compressor blades are over two feet across the face, six feet long, weigh some 3500 pounds and have a tip speed of 650 mph with a centrifugal force of 800 tons constantly pulling at their roots! At the right is a stator for one of the two massive 83,000-hp synchronous motors which are over 21 feet high, weigh 225 tons and are at least one third larger than any other synchronous unit ever built.

THE SCOPE OF WESTINGHOUSE IN AVIATION

Basic aircraft systems

Turbojet Engines, Fire Control, Radar, Autopilots, Communication Equipment and Electrical Systems.

Ground equipment

Wind Tunnels, Airport Lighting, Industrial Plant Apparatus.

Air-borne system components

Transformers, Rectifiers, Instruments, Gyro-motors, Temperature Control Panels, Generating Equipment and System Control, Circuit Breakers, Contactors, Motors, Actuators and Hoists, Electronic Tubes, Magamps, Micarta®.

YOU CAN BE SURE... IF IT'S

Westinghouse

Education Answer to Structural Failures

Flying IFR conditions without training is major cause; industry-government program planned.

By Lois C. Philmus

GOING BEYOND limitations has been established as the cause of the rash of structural failure accidents in mid-air that has plagued non-carrier aircraft, but the exceeding of limitations was not due to the design of the planes involved.

In 90% of the 339 mid-air structural failures recorded over the past five years, it was the pilot who exceeded his limitations, not the aircraft. CAA reports that of this total, 60% of the pilots were definitely in violation of the Civil Air Regulations.

Cleaner Planes Affected

The problem has come to the fore as lightplanes have become cleaner and faster in design. Particularly affected are such aircraft as the Beech Bonanza, the North American and Ryan Navions, Bellanca Model 14, and Cessna 170 and 195. Beech has come in for the major portion of the criticism because there are more Bonanzas flying than the other models.

In all cases the aircraft are stressed beyond required minimums. The original Model 35 Bonanza was static tested to over six G's ultimate, which is seven per cent greater than CAA specifications. Since then the Bonanza has been stressed to withstand over eight G's, 42% greater than required.

What is happening then is best described from CAB summaries of structural failure accidents. The following phraseology appears time and again: "Pilot *without instrument experience* became involved in instrument conditions, exceeded the stress limits of the aircraft, and a structural failure occurred in flight"; or, "Evidence indicates the right wing failed, followed later by severance of empennage due to excessive loads imposed on aircraft in flight. *Pilot reportedly had not flown on instruments for several years* and aircraft was not equipped with adequate instruments for such flight. Aircraft dived into the ground and burned."

So there is the problem: Unqualified pilots taking a chance on their lives and those of their passengers. Flying into instrument weather without instrument training. Flying into excessive turbulence without knowing proper emergency procedures.

There are two schools of thought on the solution, one favoring regulation, the other favoring education. There is a third solution, however, which would set lightplane flying back about 10 years. That is to "dirty up" the planes. If one of the two solutions does not work out, this would be the only alternative.

But the healthy period of the lightplane has been brought about by the faster and cleaner aircraft, which takes the businessman where he wants to go quickly and safely, if he adheres to safety rules. So, according to both government and industry officials, this answer cannot be considered at this time.

John P. Gaty, vice president and general manager of Beech, proposed to CAB and CAA that a regulation be considered whereby any pilot licensed to fly airplanes with a top speed of 125 mph or more would be required to take a one-hour period of instrument instruction during which the "airplane will be upset once and he will be instructed to right it to level flight." This, Gaty feels, will convince such pilots of their inability to fly instruments without instruction in a way that will not be forgotten.

Required Time Suggested

William P. Lear, chairman of Lear, Inc., has suggested to CAA that a regulation requiring a certain amount of instrument time be instituted before a pilot can qualify for a private pilot license. He further told American Aviation that his company plans on designing and marketing a servo-gyro mechanism which would impose artificial stability on the aircraft. As part of the industry-government program, the device will be offered at between $200 and $250.

The majority of the people involved are opposed to regulation, however, and favor education. Max Karant, assistant manager of Aircraft Owners and Pilots Assn., states that regulations are adequate. He feels that instrument time regulations should not be imposed on the pilots, since the majority will never use instruments, preferring to keep out of any kind of weather.

CAA and CAB are inclined to agree on the grounds that instrument flight must be constantly practiced to be of value and could be a further danger, if it were not practiced, by instilling false confidence.

A nationwide educational program therefore is the goal of all involved. Beech has already invested over $40,000 in the past five years by periodically distributing safety suggestions to over 15,000 pilots and aircraft owners. AOPA in its official publication carries a "Safety Corner" section in which the causes of such accidents are carefully described. CAA has been running safety forums throughout the country with a total attendance to date of over 30,000.

But still more must be done, according to E. W. Hudlow, CAA's chief of the general safety division. The nation must be blanketed with the theme that a pilot should be properly equipped for instrument flight or he should get out of instrument weather at once.

Set Up Standards

CAA is planning a proposal to AIA, whereby industry would take the lead in the campaign. The plan calls for every manufacturer to set up emergency standards for his particular aircraft and to make up a simple placard to be installed in each aircraft operating.

The placard, as Hudlow envisions it, would contain the following brief information: Proper setting for slow-down speed; direction to drop gear where possible; instruction not to fight the plane. The placard would be recommended for absolute emergency, not in lieu of instrument instruction. The basis is that at some time a pilot, no matter how careful, who does a lot of cross-country work, will inadvertently get into weather.

The placard, is "just in case," but the entire education program would involve the manufacturer, his distributor, the airport manager, and the plane owner, with CAA cooperating through its safety agents.

CAA agents are being instructed to call on as many "clean" plane owners as possible in person to stress the importance of the pilot not exceeding his training and experience. Plane distributors have worked in the past, and will be asked in the future to work, with their customers on proper handling of the aircraft. Airport managers would be asked to enforce wherever possible filing of flight plans and observance of weather warnings through CAA agents.

Publicity, pamphlets, advertising would be used. As Hudlow puts it, the pilots may be in violation of regulations

Grandmother and child on way to rejoin "Mommy" in Santiago, Chile . . . photographed in a corner of "Fiesta Lounge" aboard El InterAmericano

"When your mommy was just your age–we flew in South America with Panagra!"

Like this grandmother who's introducing the 3rd generation to the world's friendliest airline, many of our passengers have been flying with us since 1928 . . . when Panagra pioneered air service on South America's West Coast.

Today, Panagra offers ten flights weekly to South America . . . all by latest-type pressurized planes. Choose deluxe *El InterAmericano*, daily DC-6, or thrifty *El Pacifico*, DC-6B tourist service. Call your Travel Agent or Pan American World Airways, U.S. Sales Agent for—

Frye Speed Trophy won by El InterAmericano

PANAGRA

Pan American-Grace Airways

but it is impossible for "CAA to sit on every pilot's shoulder while he is flying." He must be instructed and drummed at constantly that he must hire a proficient pilot, get proficient himself, or keep out of weather."

This is the immediate solution. But it has been reported that CAB Chairman Oswald Ryan in a letter to a manufacturer envisions possible revision of CAR Part 3, requiring increased control forces. Hudlow, on the other hand, feels that in future designs the manufacturer might consider an "emergency dirty-up" device, i.e., dive brake or easily disengaged landing gear. He feels the single-axis autopilot would be a future solution and a standardized instrument panel another.

For the present, to protect the thousands of "clean-aircraft" pilots now flying, intensive "regulation by education" must be formulated and carried out.

• • •

Marietta Takes Over C-130 Design Tasks

Lockheed Aircraft Corp.'s Marietta division has taken over design responsibility for the C-130 turboprop cargo transport. The department for coordinating activities on the project between the Georgia and California divisions has been dissolved, but M. E. Davenport, west coast purchasing representative of the Georgia division, has been retained for coordination and liaison functions. R. S. Wilcox, manufacturing engineering representative, has returned to Marietta from Burbank.

The California division is building two prototypes at Burbank and their flight testing will be carried out by its engineering flight test section. The prototype is expected to fly in February, if no engine delays are encountered.

Twenty-six per cent to 30% of parts and assemblies for the C-130 will be subcontracted. Two major assembly subcontracts have already been let to the Crosley division of AVCO Mfgr. Co. in Nashville, Tenn., for tail assemblies, and to Rohr Aircraft Corp., Chula Vista, Calif., for power packages.

AD-5 Crash Ends Ten-Year Safety Record

The Douglas Aircraft Co. test group experienced its first fatality since January 1, 1944, when Test Pilot James O. Seay crashed into Chesapeake Bay last month while testing the AD-5 at Patuxent. Because of the accident, Douglas fell just short of achieving a 10-year record for safety.

West Coast Talk

By Fred S. Hunter

NAVY'S ORDER halting Douglas El Segundo division's production of the turboprop A2D pending tests on the Allison T40 engine came as no great surprise to Douglas. The plane had become nearly four years late because of its engine troubles. Douglas started work on the A2D in 1947. It completed three planes, two prototypes and one production model. One prototype was lost during flight tests at Muroc. Allison has possession of the other and has been using it in its work on the engine. Douglas had been continuing its tests, using the production craft at Muroc. There had been some improvement, too, in the later flights. If the Navy's ultimate decision is to cancel out the A2D, termination costs will not be insignificant. Although it had completed assembly of only the one production plane. Douglas had fabricated a large number of parts, and subassemblies were in progress. Tooling costs at both the new B-6 location at Torrance and at El Segundo would also be involved. You can take a ticket on one thing: Ed Heinemann has his bright young men exploring replacement designs.

•

There's been considerable speculation as to the power plant in the Lockheed XF-104 air superiority fighter, which recently was officially confirmed in a cautious 62-word statement. P & W's J57 and Wright Aeronautical's J67 have been getting prominent mention as possibilities in the Los Angeles paper. We don't know why Wright's J65 has been overlooked. It would seem to be a better guess than the bigger engines. As a matter of fact, the thrust-to-weight ratio of the Sapphire ought to just about ring the bell for a design in the lightweight category, whether it is a fighter like Lockheed's XF-104 or an attack plane like the Douglas XA4D.

•

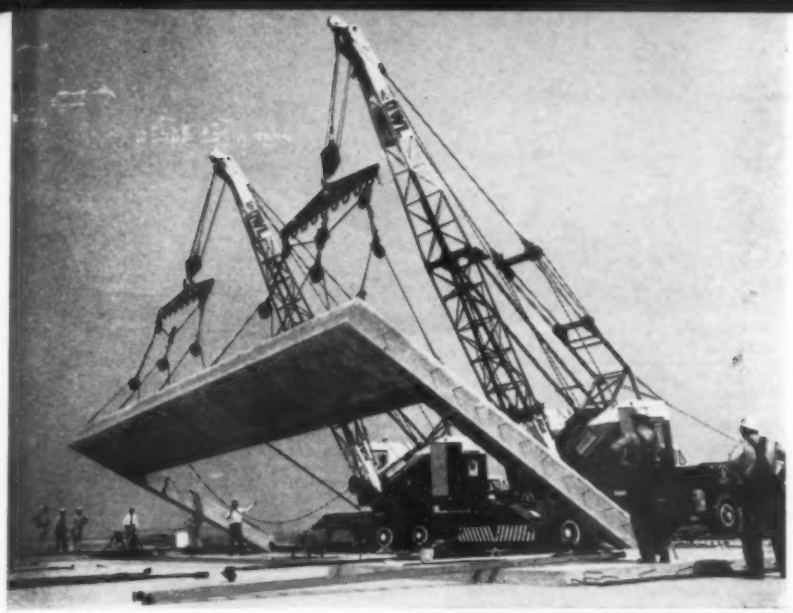
Like airplanes, labor relations in the aircraft industry must be getting more complex. Contract proposal Douglas submitted to the AFL-Machinists at the start of negotiations was 63 pages long. One of the first demands the CIO-Auto Workers made at North American Aviation was for one steward for each 50 employes and one committeeman for each 500 employes.

•

We've always been a little curious why an airline would take a football charter. "How," we asked Dick Ensign, director of in-flight service for Western Air Lines, "can you hope to make a profit after you have paid the food bill on the 12-ounce filet mignons, pound-size baked potatoes and all the other increased portions you have to provide to assuage the pangs of hunger of a planeload of powerhouse tackles and halfbacks?" Ensign explained: "Caterers will go along with you by charging you only for their actual cost of the additional food. If they added on their labor costs, overhead and other charges as they do on their regular meals, the cost would be too much for us." Now we know the secret.

•

WEST COAST MISCELLANY—**Gordon Christy** moved up to assistant sales engineering manager for Wright Aeronautical Oct. 1, after showing the ropes on the west coast to **H. J. Graninger,** former Washington representative, who succeeds him in the Los Angeles office. . . . **Ernie Gann,** the one-time American Airlines pilot, whose latest book, "The High and the Mighty," is a current best seller, is doing very well with the movies, too. His "Island in the Sky" has now been released by Warner Bros. and shooting on "The High and the Mighty" starts in January. . . . New bigger, costlier, corner ticket office for PAA in Los Angeles right across the street from TWA's appears to reflect the hot competitive battle between these two in the Atlantic. . . . **Stan Raymond,** photographer for Douglas, and a very good one, too, is the son of **Arthur E. Raymond,** Douglas' vice president of engineering. . . . **A. P. Wilson,** Convair test pilot, learned to speak Italian in order to instruct Aerolinee Italiane Internazionali pilots in the operation of the 340.



Raising the wall puts one section of new North American plant in place. Unit is the largest pre-cast concrete wall section ever hoisted into place. Hangar-door type of construction is designed to accommodate final assembly production if necessary. Plant will initially be used for F-100 Super Sabre fuselage assembly.

Production Lines

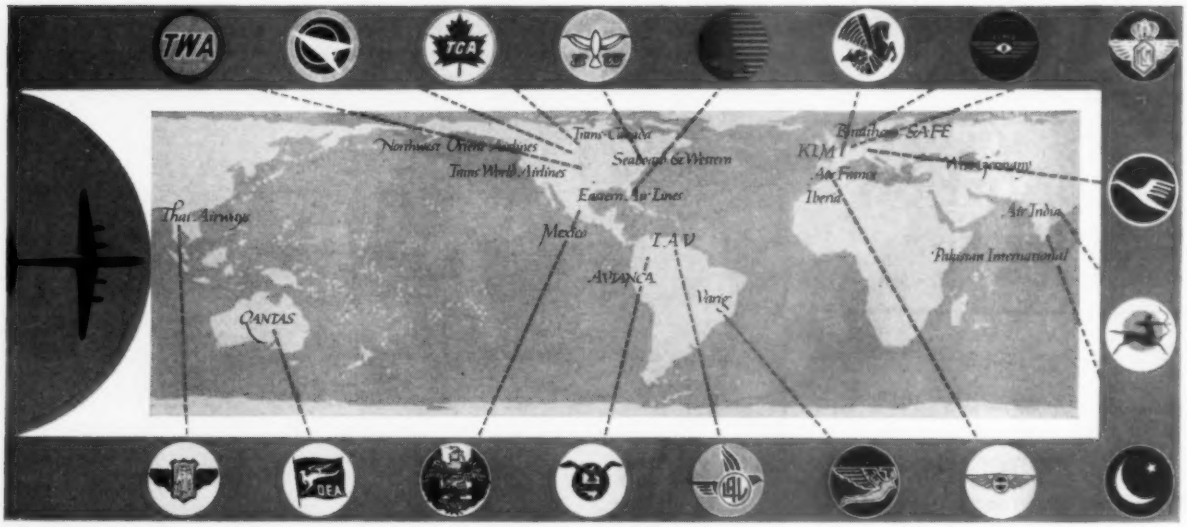
Ceramic coatings are applied to combustion chambers of the G-E J47 engine at Solar Aircraft's conveyorized production line in its San Diego plant. Coatings protect against high temperature oxidation and corrosion. The 4000-foot-square installation has cut coating time in half.

One hundred Aero Commanders have been delivered, as of 18 months after delivery of first production model. Eight aircraft a month are now being turned out at Aero Design's Oklahoma City plant. Employes now number 600.

Leadership Demands Constant Achievement

With World Airlines...

It's Super Constellation 4 to 1



ORDERED BY 4 TIMES AS MANY AIRLINES AS NEAREST U.S. TYPE

...TWICE AS MANY AS FOREIGN JET TYPES

18 AIRLINES, serving every continent in the world, have already ordered Lockheed Super Constellations:

AIR FRANCE ... AIR INDIA ... AVIANCA OF COLOMBIA ... BRAATHENS OF NORWAY ... EASTERN AIR LINES ... IBERIA OF SPAIN ... KLM ROYAL DUTCH AIRLINES ... LAV VENEZUELA ... MEXICO ... NORTHWEST ORIENT AIRLINES ... PAKISTAN INTERNATIONAL ... QANTAS OF AUSTRALIA ... SEABOARD & WESTERN ... THAI AIRWAYS ... TRANSCANADA ... TWA-TRANS WORLD AIRLINES ... VARIG OF BRAZIL ... WEST GERMANY.

NEW SPEED—*Hours* quicker to destination. *On time* departures, and *on time* arrivals!

NEW RANGE—Non-stop range on longer routes than ever before. Plenty of margin to go around and over weather.

NEW POWER—13,000 horsepower! Latest type turbo-compound Wright engines. Power to spare means *better performance, better dependability.*

NEW COMFORT—5 separate cabins to roam through. Interior design by Henry Dreyfuss for people who *enjoy* travel.

NEW LUXURY—Spacious lounge and glamorous decor *unlike any other airplane* in the world.

INSIST ON SUPER CONSTELLATION! IT COSTS NO MORE TO FLY THE BEST!

Lockheed Super Constellation

LOCKHEED AIRCRAFT CORP., BURBANK, CALIF., AND MARIETTA, GEORGIA

Look to Lockheed for Leadership

Lockheed

Super Constellation Sales Lead

Super Constellation sales for the first half of 1953 gave Lockheed a midyear backlog of nearly $150,000,000 in commercial aircraft—a new record. As a result, more Super Constellations are on order and more dollar backlog confirmed than for any other commercial transport of this type in the world.

Lockheed's transport production line is now at a higher peak of activity than at any time in Constellation history, and on the basis of hard cash on the counter the Super Constellation has proved itself the most popular single transport in the world today.

All Orders Are on Schedule

Lockheed production this year will approximate $765,000,000 in commercial and military planes—topping the record for the entire industry for any prewar year. In spite of this tremendous output of 12 different types of aircraft, every single production order is on schedule both in California and at the Marietta, Georgia, plant.

Lockheed News Briefs

A newly formed group of Lockheed engineering scientists will devote full time to the study of aviation trends 10 to 25 years from now.

The Navy's big Lockheed P2V patrol plane will now have a tremendous extra burst of speed for quick getaway in enemy waters. When used for anti-submarine warfare, 2 jet engines will be slung under the wings in quick-detachable pods, giving added thrust to its twin turbo-compound engines. Now experimental, but being considered for wide-scale use on the versatile P2V Neptune.

Military interest is high in the recent operations of turbo-compound Super Constellations as early-warning picket planes for the U. S. Air Force as well as the Navy. U.S.A.F. designation is RC-121C, Navy is WV-2. Each carries 6 tons of latest electronics equipment, accommodates a crew of 31. Gives the U. S. high-flying radar stations that will extend our warning system far beyond the horizon limits of surface radar.

A new Lockheed-developed leak-proof fuel-line coupling is now being installed in Lockheed jet aircraft. Provides greater safety against leakage, is only 20% the weight of former types.

Lockheed engineers have produced a new automatic ejection seat making possible a more fully guided catapult stroke and saving space by compacting the seat and its accessory equipment.

Lockheed has produced and delivered its 25,000th airplane.

Extra Section

By Joseph S. Murphy

CAA's new safety director, Al Koch, couldn't have picked a better way of winning the support of all field safety agents than his first-day move to wipe out the agent's daily diary and all the cumbersome paperwork that went along with it. The "little black book," as it was called, had become a thorn in the side of most agents, who were inclined to shrug it off as just another example of what the bosses in Washington shouldn't be doing.

The word came out on September 1 when the temperature in Washington, D. C., was hovering near the 100° mark. One local CAA office reported a 10° drop in temperature when the Koch order was announced.

The return of Al Koch to the scene in his third assignment as top safety man in CAA brings back to mind some of the strong views he voiced in the past on returning much of the responsibility for maintaining safety in aviation to industry. The subject is again very active and very popular with top Commerce officials, and there is no reason to believe that Koch has changed his viewpoint one iota.

•

One recommendation that Koch made to the Senate back in 1947, when S. 1677 was being proposed to completely overhaul the Civil Aeronautics Act, would have required that each scheduled airline set up a full-time staff to study continually all of its operations with the sole view of increasing safety. This staff would report to the top operations official of the airline and would have full authority to take immediate action in preventing accidents and eliminating unsafe conditions.

At the time Koch classed this as a "must," and although S. 1677 died a natural death at the close of Congress that year, it is interesting to note that two of the major airlines, United and Northwest, have adopted the idea within the past two years.

•

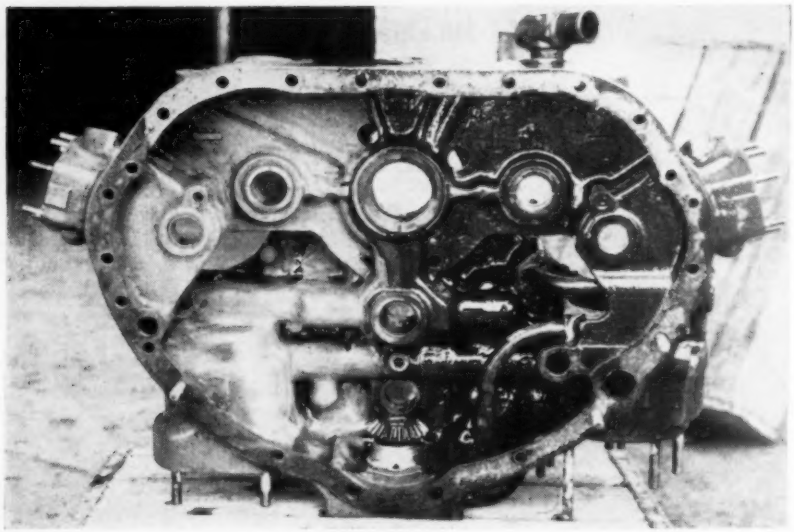
Another recommendation made to the Senate by the new safety director back in 1947 is also showing some signs of renewed consideration. It deals with the duplication of safety activities in the CAB and CAA staffs. The particular proposal had to do with accident investigations and sought legislation that would put the complete job in CAA's bailiwick, while still retaining the feature whereby the five-man Civil Aeronautics Board would make the broad determination of what the probable cause of an accident was.

The argument here is that CAA participates in all accident investigations anyhow and in many instances conducts the complete investigation, with the result that there is often a direct duplication of effort. From this dual participation in safety by both the CAB and CAA there remains today quite a bit of confusion in industry over who gets what report, or what is a mechanical difficulty report and what is an accident.

If an operator experiences an incident, for example, of a defect resulting in smoke in the cockpit, or perhaps a minor fire, under one set of rules it should be reported to CAB. But the CAA agent assigned to the carrier is convinced it is a mechanical difficulty item, and hence wants his report. The result—a duplicate report to both agencies.

Here again there have been some rumblings of pressure by the new Administration to iron out these areas of duplication between the CAA and CAB, and according to one report the CAB has already begun to take another look at its part in accident investigations. When one looks at some of the attendance lists for major accident investigation hearings the general idea of single-agency handling looks as though it has some merit. In one particular hearing during the past year CAA and CAB combined had 20 representatives taking part throughout a five-day-long session.

Maintenance Bulletin Board



NO SCRAPING OR DESLUDGING was needed on this accessory gear case which had been treated with Cee-Bee R-49 periodically during 1160-hour service. Left side has merely been rinsed with solvent; right half shows appearance before rinsing.

New Sludge Removal Compound

A new engine sludge removal compound soon to be announced by the Cee-Bee Chemical Co. of Downey, Calif., may bring reduced engine operating costs through extended overhaul periods. The compound is called Cee-Bee R-49 and when used periodically between overhauls is designed to remove sludge deposits in many engine areas and control them in others to an extent that will allow use of higher engine TSO.

During tests on a Pratt & Whitney R-1830 engine, the R-49 compound was used at 300-, 700-, 900-, and 1160-hour intervals and Cee-Bee concludes that it will keep the oil system in the condition of a low-time engine for an indefinite period. Instead of the hard, scaly carbon deposits normally found, the tests showed a light, sooty deposit in most places and sludge accumulations were practically non-existent.

Other test results showed that all sludge and oil in the engine nose section could be easily removed with a light solvent rinse. Sludge cups in the reduction gear were overflowing with soft sludge.

On the engine power cases where deposits are usually crystalline in nature, only a soft carbon build-up appeared and was easily rinsed off with solvent. The crankshaft could be cleaned with a rag dampened in solvent, and the front crankpin hole was about 2/3 full of sludge while the rear was about 1/3 full.

Cylinder connecting rods were almost completely cleaned with a solvent rinse, according to the Cee-Bee company, and although scaly carbon remained in the piston end of each one and scattered spots of sludge were found in the web of a few, they all rinsed clean with solvent.

As to other engine locations, pistons looked relatively normal, all rubber seals were found unharmed, and there was no evidence of abnormal corrosion to aluminum, steel, or magnesium alloys or to lead-indium, silver- or cadmium-plated parts. The accessory drive shaft on this engine, which is usually packed with sludge where it passes through the impeller shaft, showed no sludge when R-49 was used, the report indicated.

Engine oil consumption was also cut by the desludging process. Where a comparable untreated engine began to consume 2.5 quarts of oil per hour in the 150- to 400-hour period, one treated engine operated to 900 hours TSO before it reached the 2.5 quart per hour oil consumption rate.

Cee-Bee estimates that the processed engine burned anywhere from 500 to 750 fewer quarts of oil than is normal for the R-1830. The company's proposal for the use of R-49 calls for treating the engine at intervals of 100-200 hours with this three-step process:

1. Disconnect normal oil supply.

2. Run engine for 15-30 minutes at 1200-1500 rpm with a mixture of R-49 and engine oil in the lubricating system.

3. Run engine for an added 15 minutes with a flushing oil mixture, then reconnect normal lubrication system.

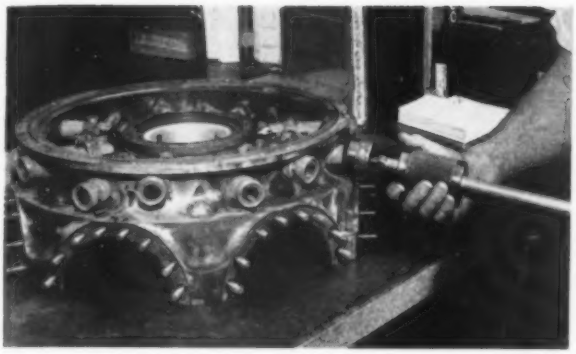
• • •

First R-4360 Through New PAA Overhaul Shop

First overhaul of Pratt & Whitney R-4360 power plant by Pan American World Airways Pacific-Alaska Division was completed recently in its new $750,000 engine shop at San Francisco Airport. The shop is now equipped to overhaul the P & W R-2000 as well as the R-4360, and the plan is to add R-2800 facilities soon in a program to replace Alaska Division Douglas DC-4 aircraft with DC-6's.

New PAA shop provides 26,400 square feet of shop space for engine and accessory overhaul. Past R-4360 overhauls for PAD had been handled by Pacific Airmotive Corp. at Burbank, Calif.

FIRST P&W R-4360 overhaul gets final check at new Pan American San Francisco engine shop.



IMPACT WRENCH formerly used made inspection control virtually impossible. Torque wrench (right) now gives accurate check, and cuts premature engine removals.

Torque Wrench Cuts Engine Removals

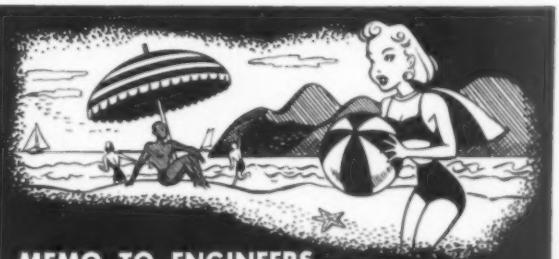
Northwest Orient Airlines has found the solution for premature engine removals due to loose tappet guides in its Pratt & Whitney R-1830 and R-2000 operations. A new method of checking these guides during engine assembly, devised by NWA materials inspector Lyle Canaday, now calls for the use of a torque wrench and adapter instead of the conventional impact wrench.

According to Northwest the impact wrench used in the past made it virtually impossible to control inspection standards. As a result, during the year prior to adoption of Canaday's idea three premature engine removals were charged to loose guides.

By use of the torque wrench for the checking process, the mechanic gets an exact reading in inch-pounds during the check, taking the guesswork out of the operation and eliminating the possibility of mistakes in the process.

Proof of success of the new method is found in NWA's estimated saving of $2500 after a one-year trial. During this time no premature engine removals resulted, bringing a $250 award to Canaday under the company's employee suggestion plan. • • •

Hinge-mounted stewardess seat built by Aerosmith, Inc., of Miami, Fla., and adopted by National Airlines on its Douglas DC-6 and DC-6B's is demonstrated here by NAL hostess Lee Wade. Seat weighs 16 pounds complete and when not in use can be folded and stowed against wall forward of right hand lavatory door. Installation also allows use of standard Douglas seat on left hand side.



MEMO TO ENGINEERS...

...who seek an environment of advanced concepts, where a premium is placed on originality, and intelligence is the criterion of advancement.

Would you like working for one of the nation's major producer-developers of automatic control systems and gyro components used in guided missiles, target drones, aircraft?

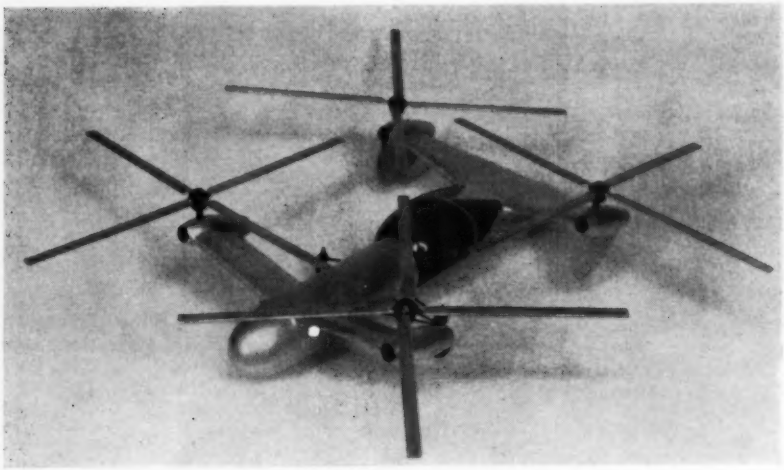
We need men with degrees in Mechanical, Electrical and Aeronautical Engineering or the equivalent. If you have knowledge of servomechanisms and experience in the design or fabrication of gyroscopes, servo actuators, electro-mechanical instrumentation; if you have used test equipment, oscillographs, recorders, computers and environmental equipment; and if you are familiar with military specifications, we would like to become acquainted with you. Although desirable, an administrative background is not necessary for an engineering assignment.

We invite you to realize your future in a new field, unimpeded by old-guard dogmatics, in association with a progressive organization while living on the Riviera of the West. Write at once to

SUMMERS GYROSCOPE COMPANY

2328 BROADWAY, SANTA MONICA, CALIFORNIA

Attention: Robert L. McGuire, Director of Industrial Relations



Dynamic testing of extruded rotor blade sections will start soon at Convertawings, Inc., on Long Island. The blades, which have a chord of 3.75" and were developed by Jacobs Aircraft, will be tested on Convertawings prototype of a four-rotor compound helicopter. Version designed as high performance military rotorcraft is shown in model form above. Improved handling characteristics are predicted.

Books

THE SPIRIT OF ST. LOUIS *by Charles A. Lindbergh. Published by Charles Scribner's Sons, New York. 562 pages, illustrated. Price $5.*

Twenty-six years is really a short period in history. In aviation it spans more than half the industry's young life and antedates a great cross-section of the people making up what is today one of the country's biggest businesses.

That's why everyone should read Lindbergh's personal account of the preparations and accomplishment of the now famous New York-Paris flight in his 5135-pound Spirit of St. Louis. In a lucid writing style which is almost as remarkable as the story being told, Lindbergh makes it possible to relive the events which fired the imaginations of the common people and proved the turning point in public acceptance of aviation.

This is not the story of the New York-Paris flight. It is a fascinating account of the "state of the art" in 1926-1927. The hour-by-hour account of the trans-Atlantic flight might prove of prime interest to a pilot. But any engineer or technician who ever looked at the famed Ryan monoplane will be fascinated by the account of its design and production, the factors which went into design decisions which finally shaped the strange looking single-engine ship which accomplished what had stumped multi-engine airplanes and their more famous crews.

The navigator or radioman who is not surprised and even appalled by the nature of Lindbergh's preparations for this flight, reflecting the "state of the art" in this period, would indeed be rare. Today's pilots, accustomed to well-defined airways, reasonably accurate weather forecasts, well lighted airports, and similar "necessities" will find a fairy-tale atmosphere to the accounts of Lindbergh's early activities as an air mail pilot flying the surplus de Havilland's of World War I.

Specific aspects of "The Spirit of St. Louis" can be cited for every aviation interest. Perhaps more impressive is the rapidly mounting number of industry people who comment that their wives, who are normally immune to aviation literature, have picked up the volume and read it through with fascination.

As for this reviewer, the most surprising aspect of the story is the intense competition which surrounded the whole flight. It might well be said that it was the "Grace of God" that made Lindbergh the successful pilot.

The take-off of France's Capt. Charles Nungesser and Francois Coli in a Levasseur biplane on May 8, 12 days before Lindbergh's attempt, turned Lindbergh's mind back to planning a trans-Pacific flight in the same way that each of several closely timed attempts had disheartened him in his hopes to win the Orteig $25,000 award for the first non-stop crossing. But Nungesser and Coli disappeared over the Atlantic.

It was late April when Lt. Commander Noel Davis and Lt. Stanton H. Wooser lost their lives in the last trial flight prior to take-off in the "American Legion." Lloyd W. Bertaud had been picked to navigate Clarence Chamberlain or Acosta in the famed Bellanca monoplane as late as April 19, but on April 24, during a routine pleasure flight, the Bellanca made a crash landing which ended this program. There were many others. Most were planned before Lindbergh's, had greater financial backing, more experienced pilots, etc.

What if Lindbergh failed? He was flying a single-engine landplane over a 3600-mile route, largely over water. He carried no parachute, no radio, no real navigation instrument except the compass mounted in such a position he had to view it in a mirror. His aircraft did not have a windshield for forward vision. When he made the decision to fly the North Atlantic he had never flown non-stop for more than a few hours but this flight would run nearly 40 hours. His flying experience was scant.

He had been warned by the experts that he should not attempt the flight in a single-engine plane, that more experienced piloting was needed, that a solo pilot could not make the flight without relief, etc.

But Lindbergh was successful against overwhelming odds. He showed the way and the world followed. And at this late date he has proved that, even if his flight had never come off, he could have made a good living as a writer.

. . . WDP

Railroads Protest C-46 Troop Traffic

The Defense Dept. has been urged to ban use of "outmoded C-46" cargo planes in the carriage of American troops by non-scheduled airlines. The recommendation was made by Walter R. McDonald, a member of the Georgia Public Service Commission, in a report given before the National Association of Railroad and Utilities Commissioners during its annual meeting in New York.

Noting that CAB will not permit scheduled carriers to use C-46's in passenger operations, McDonald, who also is chairman of a committee cooperating with the ICC in a study of declining passenger movement on railroads, stated that a similar ban should be imposed on non-scheduled lines "to reduce the number of fatal air crashes."

McDonald said the 1952 safety ratio of non-skeds of 2.08 fatalities per 100,000,000 passenger-miles was "more than 52 times as high as the railroad fatality ratio of 0.04." He added that the railroads were "disturbed" over the loss of military passengers to non-scheduled air carriers. He said that although these lines carried only 8.9% of such traffic in October, 1951, the figure is estimated to have risen to 25.6% by February, 1953.

TEST EQUIPMENT in Tactair Navion includes latest button (left) and corner feeler (right) elements. Special gyro set-up (center) speeds element wiring.

Tactair Develops Flight-by-Feel Unit

Signal feeler flight system frees pilot from need for anticipating plane's motion; Navy evaluation under way.

By Lois C. Philmus

A SIGNAL FEELER flight system, which relays all changes in control position of the aircraft through a feeler device on the control wheel or stick, is under development by Tactair, Inc., at Wings Field, Ambler, Pa. Two units produced under a development contract have been delivered to the Navy for evaluation.

The device eliminates the need for the pilot anticipating the plane's motions, and frees his attention for concentration on what is going on outside the cockpit during search missions, heavy traffic, and at the point of early visual contact on instrument let-downs. The device will allow the pilot to maintain precise instrument flight on a heading or other pattern, it is claimed.

The signal feeler was conceived by Bill Harcum, who had been a research engineer with the Sperry Gyroscope Corp., and who now serves as vice president of Tactair, Inc., which was formed to further the development of the device in May, 1952.

Harcum feels the signal feeler is especially adaptable to such operations as aircraft carrier landings, where the final approach is so critical and the pilot must direct his attention outside the cockpit. Other applications are anticipated on Army observation missions and during IFR flights.

The system consists of a gyro horizon, directional gyro, aileron repeater bar, elevator repeater bar, directional tie-in, control panel, and aileron and elevator feel elements.

• **The standard pneumatic gyro horizon** is modified with air pickoffs which provide the roll and pitch signals.

• **The roll pickoff** consists of a flat cam mounted on the back of the outer gimbal and overlapping one or the other of two nozzles mounted on the back cover plate. The pitch pickoff, although similar in pneumatic function, is not a symmetrical system but uses a single nozzle only.

• **Repeater bars** for aileron and elevator are pneumatic amplifiers which also introduce a signal proportional to the plane's control surface position.

• **Control panel** contains bank and pitch controls, as well as a changeover valve and switch and heading change switch.

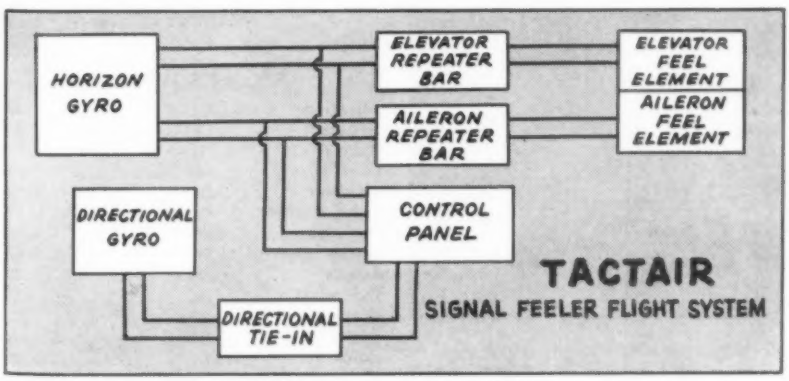
• **Directional tie-in** contains a set of atmospheric bleed nozzles which connect to the bank signal system when a heading is to be held on the directional gyro.

• **The feel elements** on the control wheel or stick provide the final message to the pilot. When both aileron and elevator buttons are parallel proper flight attitude is maintained. The pilot feels the position of the moving element in response to the fixed reference and moves the control in the corresponding direction. There is only one position of the control at any time at which the feel element is in a neutral position.

Tactair has been experimenting with several feel elements, in order to determine which concept is most psychologically acceptable. The first type was the *double pin type*, where one or two sharp pins, actuated by a small diaphragm, pricked the pilot's hand in direction of desired wheel rotation. Variations of a *button feeler type* are being studied, whereby a fixed enclosure around the button is cut away so that the finger senses the extent of retraction and extension. The latter method to a great extent does away with the tendency to reverse controls.

A *corner feeler* concept also is being tried. Here the pilot adjusts aileron and elevator motions to line up a corner fixed to the wheel with an adjacent corner which has allowable motion in aileron and elevator wheel directions. *An inner wheel type*, operating on a spoke principal, and a *gear shift type*, similar to it, also are under test.

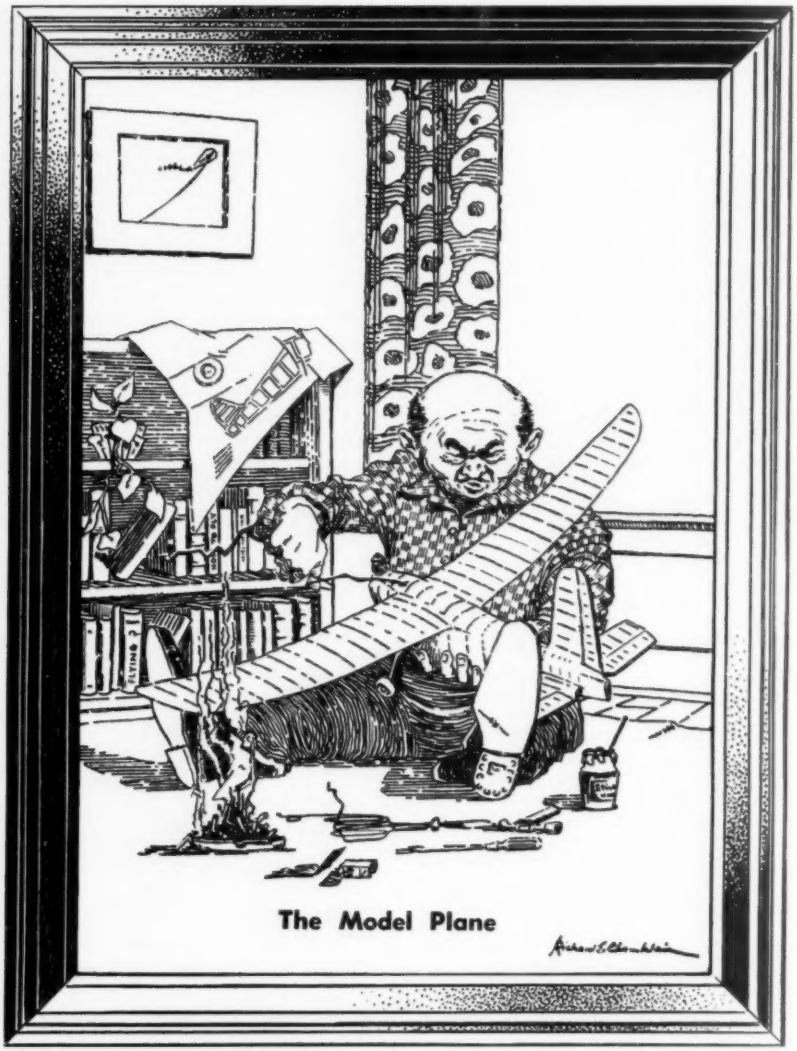
Harcum has been conducting his tests on a Navion. • • •



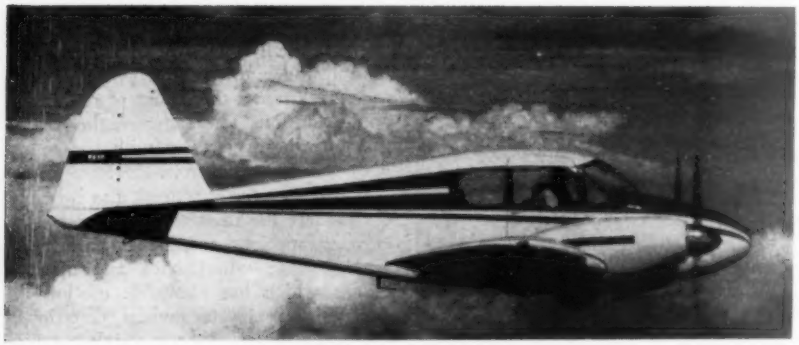
WIRING SEQUENCE of signal feeler flight system components in relation to gyros shown in simplified drawing.

Ready for Hanging

One of a series of selected portraits of some very select members of the airline family, as seen by Richard E. Chamberlain.



TRUE TO THE RESPONSIBILITIES of his job, the airline pilot lives with his chosen work, even carrying it into his home. The fact that his children are in the next lot flying their models is in no way a reflection on the pilot's tremendous knowledge of flight theory and ability to rapidly digest simply written instructions.



First production model of the Piper Twin Apache four-place transport is shown during its first flight made recently. Undergoing engineering flight evaluation tests, the Twin Apache is powered by two 150 hp Lycoming engines, has a cruising speed of over 150 mph, and single-engine ceiling performance in excess of 5,000 feet.

High Density Flight Plan Proposed by ACC

A tentative plan for special flight procedures in metropolitan areas of high density air traffic has been formulated by the ACC Air Traffic Control and Navigation Panel. A one-year trial period in the Washington area is planned if final approval is forthcoming from the civil regulatory aviation agencies.

Features of the plan include: a 180 mph speed limit for all aircraft in high density area; prominent marking of such areas on all aeronautical charts so that pilots would proceed with caution; and special procedures to be followed when visibility is reduced below five miles.

Daily Plane Utilization

Average Revenue Hours of Use Per Day Per Aircraft

First Quarter, 1953

International

American	2 eng. pass.		4:54
	4 eng. pass.		4:46
	cargo		4:57
Braniff	4 eng. pass.		8:03
C & S	2 eng. pass.		9:16
	4 eng. pass.		9:21
Colonial	2 eng. pass.		6:53
	4 eng. pass.		8:51
Eastern	4 eng. pass.		11:36
National	4 eng. pass.		8:49
Northwest	4 eng. pass.		7:55
	cargo		8:30
Panagra	2 eng. pass.		3:26
	4 eng. pass.		5:25
Pan American Latin Amer.	2 eng. pass.		3:59
	4 eng. pass.		6:00
	cargo		5:34
Atlantic	4 eng. pass.		5:40
	cargo		4:12
Pacific	4 eng. pass.		7:14
Alaska	4 eng. pass.		6:35
	cargo		7:17
TWA	4 eng. pass.		7:02
	cargo		5:01
United	4 eng. pass.		5:33

Local Service

Allegheny	DC-3	4:45
Bonanza	DC-3	6:41
Braniff	DC-3	6:39
Central	DC-3	6:07
Frontier	DC-3	7:13
Lake Central	DC-3	3:59
Mohawk	DC-3	4:38
North Central	DC-3	5:42
Ozark	DC-3	6:07
Piedmont	DC-3	6:54
Pioneer	Martin 2-0-2	6:01
Southern	DC-3	6:19
Southwest	DC-3	5:36
Trans-Texas	DC-3	5:31
West Coast	DC-3	6:27
Wiggins	Cessna T-50	2:00

Delta-C&S Air Lines

GENERAL OFFICES · MUNICIPAL AIRPORT · ATLANTA, GEORGIA

August 24, 1953

Vickers Incorporated
1400 Oakman Boulevard
Detroit 32, Michigan

Attention: Mr. F. T. Harrington, Vice President

Dear Mr. Harrington:

It was interesting to note that both Delta and C & S while still separate companies had specified Vickers pumps, motors, motorpumps, accumulators, valves etc., for the hydraulic systems of new Convair 340 aircraft. Vickers hydraulic accessories were already in service on the DC-6s and Constellations. This simplified integration of our flight equipment at the time of the merger.

Working separately, Delta and C & S arrived at the same reasons for specifying Vickers Hydraulic Accessories. We wanted accessories which would have outstanding reliability, high overhaul periods, low overhaul costs, interchangeability between aircraft and minimum parts stock requirements. We also wanted the attention of service personnel when necessary, ready parts availability for normal overhaul and repairs plus indications of continuing product improvement. As a merged company (the fifth largest U.S. Airline), we still feel that Vickers and their Hydraulic Accessories meet our requirements.

We thought you would like to know that Vickers accessories have also been specified for our new DC-7 aircraft. We are sure your company will continue to provide the effort and attention necessary to maintain the position you now enjoy with us.

Very truly yours,

DELTA-C&S AIR LINES

C. H. Dolson
Vice President, Operations

Serving the Heart of America and Six Caribbean Countries

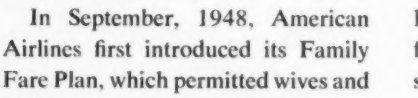
The Family Fare Plan that Eliminated "WEAK" Days

For many years the transportation industry had been troubled by the drop in passenger loads regularly incurred during the first three days of the week.

In September, 1948, American Airlines first introduced its Family Fare Plan, which permitted wives and children to travel with the head of the family for half fare on Mondays, Tuesdays, and Wednesdays.

This plan served to strengthen "weak days," level off travel "peaks" on others. It also introduced flying to hundreds of wives who had never flown before and who may have had some misgivings about their husbands' travel habits. Within six months, eleven other airlines, noting American's success, had installed Family Fare plans of their own. Today, virtually all major airlines offer this plan throughout the nation.

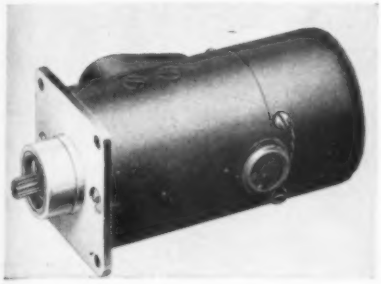
The development of the Family Fare Plan is only one of many important milestones in the history of air transportation that was introduced by American Airlines.



AMERICAN AIRLINES INC

America's Leading Airline

New Products



Midget Motor. Midget, explosion-proof d-c aircraft electric motors designed for intermittent duty have been placed in quantity production by Lear, Inc., Grand Rapids Division.

Operating from a 26-volt power source and usable in any application requiring from five to 45 watts output at speeds from 9500 to 15,000 rpm, new motors are said to be particularly suited for driving valves, shutters, flaps, and trim tabs.

Dimensions of current models in production include a maximum diameter of 1.572″ with lengths of 2.69″, 3.0″, 3.38″ and 3.88″.

Address: **Lear, Inc., Grand Rapids Division,** 110 Ionia Ave., Grand Rapids, Mich.

New Coating Withstands High Temperatures

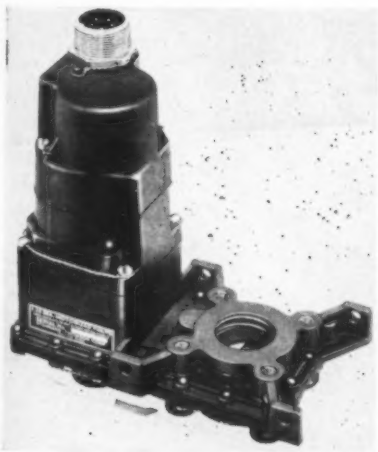
The B. F. Goodrich Co. Industrial Products division has developed a new insulating material called Pyralock, a water-base inorganic substance that can be sprayed on a metal like paint, making the treated surface capable of withstanding temperatures as high as 5000° F.

A 1/16″ coating of the insulating material protects a metal for as long as 10 seconds against flame temperatures hotter than the melting point of the metal.

The new material was developed by Goodrich to meet the special high temperature requirements of the Defense Department in rocket and guided missile work. It is non-toxic, non-flammable, and non-explosive, and will adhere to a clean metal surface without special priming for surface preparation or sandblasting.

Pyralock is resistant to most solvents and chemicals and a dried layer of the material bonds itself to the metal with sufficient strength to withstand sharp impact short of actual deformation of the metal. It will also withstand, for an indefinite period, temperature cycles in the range of minus 60° F. to plus 165° F.

Address: **The B. F. Goodrich Co.,** Industrial Products Division, Akron, Ohio



Fuel Valve. The Standard Thomson Corp. of Dayton, O., has announced mass production of a new 1¼″ fuel gate valve which will handle loads up to 2000 gallons of fuel per minute in either direction at outlet pressures as high as 60 psi. The valve has been selected as standard equipment for U. S. Air Force Boeing B-47 bombers, which use from 32 to 36 of the valves per airplane fuel system, depending on the model.

Powered by a simple permanent magnet type of motor which drives a unidirectional, planetary gear actuator, the new valve features an override mechanism in the actuator which assures positive positioning of the gate. It provides for disengagement of the actuator from the gate in the full-open or full-closed position, and for prompt re-engagement for actuation.

Another innovation designed to reduce seal wear is a cam-operated mechanism which retracts the seal rings from the valve gate just before the gate is set in motion. The rings remain retracted until the gate is returned to the closed position. Required operating temperature range for the valve extends from —65° F. to +160° F. and a thermo-relief valve permits fuel to by-pass the valve under pressures resulting from fuel expansion due to extreme temperature changes.

Address: **The Standard-Thomson Corp.,** 216 South Main Street, Dayton 2, Ohio.

Gear Reducer. Globe Industries, Inc., has developed a planetary gear reducer and motor combination for applications where space requirements are limited and a high efficiency power source is needed. The gear reducer is available in 18 different ratios ranging from 17.8:1 up to 21,808:1 and assemblies are supplied with either a 1/50 hp or 1/100 hp permanent magnet "Moto-Mite" motor. Dimensions are 1 3/8″ diameter with lengths varying from 2 7/16″ to 3 11/32″.

Address: **Globe Industries, Inc.,** 125 Sunrise Pl., Dayton 7, O.

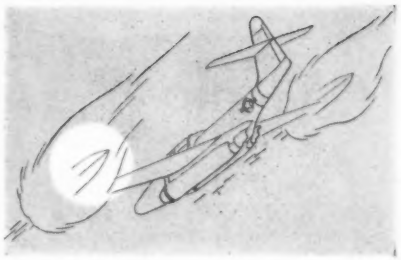
AIRCRAFT Rheem DIVISION

Serving the Aviation Industry

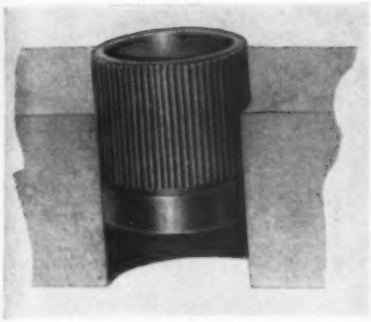
. . . as prime contractors to the United States Government and sub-contractors to Lockheed, Douglas, Northrop and Convair.

Rocket pods and nose for the U.S. Air Force's Northrop Scorpion F-89D, pictured here, are products of Rheem.

Contact us for the answers to your production problems.



RHEEM Manufacturing Company . . . Aircraft Division, Downey, California

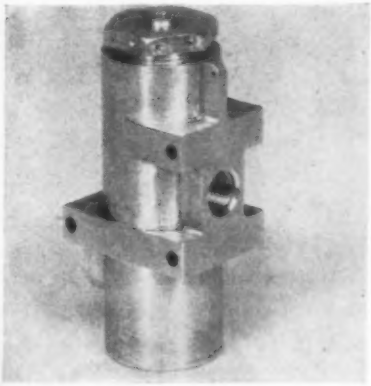


Broached Bushing

A low cost, broach fit bushing of hardened steel, treated with a black oxide corrosion preventative, has been placed on the market by Aeroquip Corp. The new unit features a broached outer surface which on installation cuts its way into the plastic, steel, or other metal of the parent body without danger of cracking the material.

By reason of its low cost, the broached bushing can be used in many applications where conventional type bushings would be too expensive, or where high precision bushings are used for want of a less expensive item.

Holding feature of the new Aeroquip bushing is a chip retainer ring designed to gather displaced metal and to act as a lock after installation. If desired, units can be replaced after service without reworking the hole. Address: Aeroquip Corp., Jackson, Mich.



Relief Valve

A lightweight pressure relief valve for both low and high pressure oil and water systems, containing only one moving part, has been announced by Anco, Inc. Unit is preset at the factory to meet a given pressure specification. It uses a valve seat formed of two hardened steel pieces, ground and lapped for long life.

The new Anco valve is made up of less than a dozen parts and is available for in-line applications as well as in a side-port model. Weight for a typical ½" aircraft tubing installation is about 12

Northrop's Prime Equation

Northrop *boundary-layer research scientists*, like the man above, are concerned with complex problems aimed at achieving the maximum efficiency in aerodynamic surfaces at high speed.

Equations are used to solve problems. At Northrop Aircraft, the prime equation combines teams of administrators, outstanding scientists and production specialists with modern industrial and research facilities. The combination efficiently converts imagination and knowledge into actual matériel of advanced design and incalculable value.

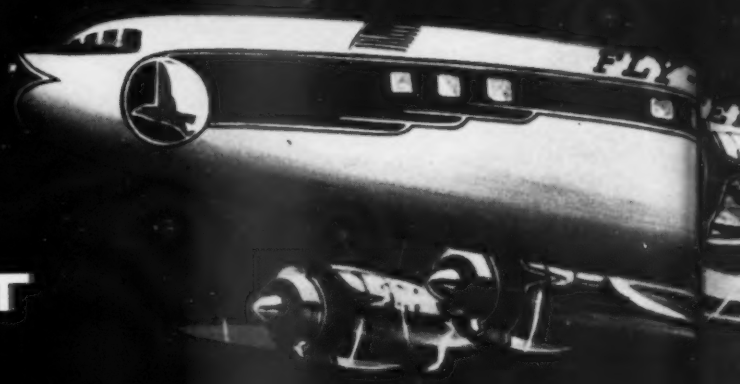
NORTHROP AIRCRAFT, INC.
HAWTHORNE, CALIFORNIA
Pioneer Builders of Night and All Weather Fighters
BA12

SINCLAIR SALUTES

THE

GREAT

SILVER FLEET...

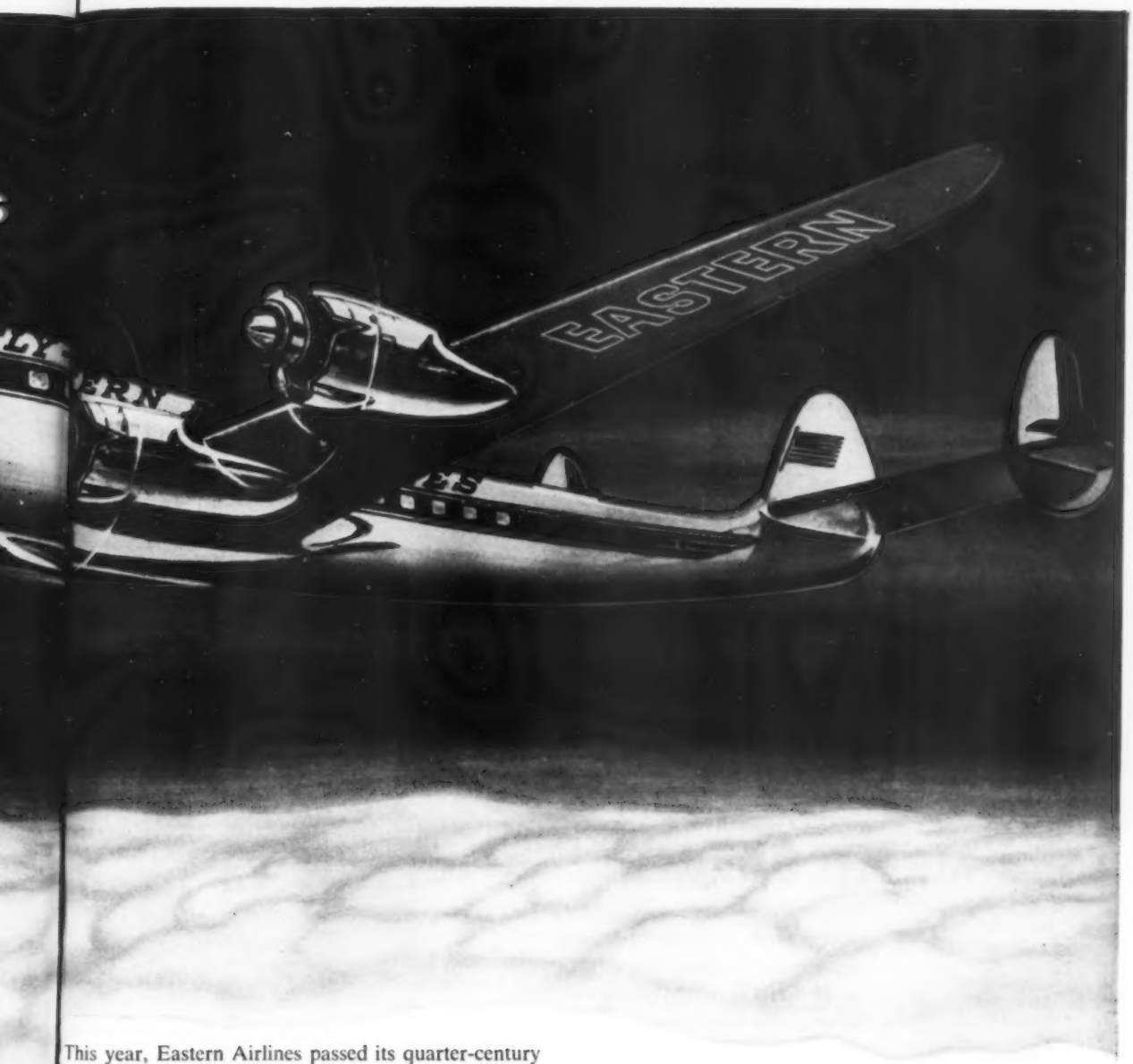


ON ITS

SILVER

ANNIVERSARY

25th ANNIVERSARY
Experience Inspires Confidence
EASTERN AIR LINES



This year, Eastern Airlines passed its quarter-century mark of steadily-expanding service. Last year, for example, the Great Silver Fleet transported some 4 million passengers and averaged 170,000 miles a day over its network of air highways.

One important reason for Eastern's position in the Aviation industry is the fact that they test – *and select the finest products available*. Sinclair is proud that this year, again, Eastern has chosen to use Sinclair Aircraft Oil exclusively. *Today, more than 45% of the oil used by major scheduled airlines in the U. S. is supplied by Sinclair*. Why don't you place your confidence in Sinclair Aircraft Oil?

SINCLAIR AIRCRAFT OILS

Sinclair Refining Company, Aviation Sales · 600 Fifth Avenue, New York 20, N. Y.

Best "Route" Forward

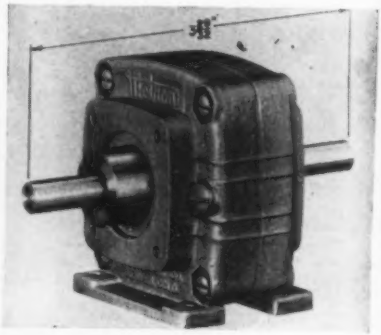
Performance of the specially designed Chase Assault Transports has excelled specified design requirements; has convinced even the most skeptical.

Fast, safe delivery of troops and equipment to forward combat areas by ***landing,*** during numerous demonstrations, has proven conclusively the role which assault transports will assume in warfare, a role which only those planes developed by the Army-Air Force-Chase team are able to fulfill.

No injuries to troops, damage to equipment, or time consuming reassembly or unpacking of vehicles or weapons. The best route forward is the Assault Transport Route.

Chase AIRCRAFT CO., Inc.
WEST TRENTON, NEW JERSEY
STROUKOFF AVITRUC

ounces. Address: **Anco, Inc.,** 1 Baker St., Dept. 55B, Providence, R. I.



Speed Reducers

Small speed reducers, called the Metron Bantam series 10, available in over 600 different reduction ratios, have been announced by the Metron Instrument Co. Designed for close-quarter installations in chart drives, computers, oscillographs and servomechanims, the new units are nominally rated at 1/10 h.p. and measure $2\frac{7}{16}$" high and $2\frac{3}{8}$" wide. Address: **Metron Instrument Co.,** 432 Lincoln St., Denver 9, Colo.

Pressure Switch

A pressure switch with applications including control system actuation, pressure systems or shut-off devices, and which is factory pre-set to operate at any differential pressure between 10 and 200 psi, has been introduced by G. M. Giannini & Co., Inc. Designated the model 44517 pressure switch, the new unit is said to withstand and operate under 0.032" double amplitude vibration from 10 to 55 cycles per second.

The switch features a high overpressure rating and is suitable for use with engine oil or hydraulic fluid in the gauge port. Unit will operate in temperatures ranging from —54° to +71° Centigrade, and at altitudes up to 50,000 feet. Switch section is rated for five amperes at 125 or 250 volt a-c, and three amperes inductive motor load at 30 volts d-c.

Address: **G. M. Giannini & Co., Inc.,** 117 E. Colorado St., Pasadena 1, Calif.

PASSENGER COMFORT ASSURES REPEAT TRAFFIC

Fresh as a Daisy!

He rode on an AEROTHERM Seat

Refreshing relaxation is an inherent quality of Aerotherm's Model 366B-2 Double Passenger Seat. Cushioned with molded foam rubber of cored sections, the seat reclines to a relaxing 40° for day seating or to a full 70° slumberous recline for night resting.

Frame structure is of strong, lightweight magnesium and aluminum alloys for maximum weight holding capacity within load limits.

Aerotherm seats are designed for lightness, ample safety exceeding current load factors, and for luxurious comfort. They relax passengers . . . instill confidence in flying safety . . . make flying on your planes a habit.

Write today for descriptive literature.

Offices in all principal aircraft centers.

MODEL 366B-2

Project Engineers

THE THERMIX CORPORATION

GREENWICH, CONN.

Canadian Affiliates: T. C. CHOWN LTD. Montreal 25, Quebec, Toronto 5, Ontario

THERMIX *Project Engineers for* AEROTEX pd HEACON *Manufactured by* AEROTHERM

Air Freight's Battle of the Giants

American Airlines locks horns with the Flying Tiger-Slick Airways combine over rates, mail, and a merger.

By William V. Henzey

A BATTLE between airlines that started over six years ago in the Air Freight Case has broken out on three new fronts and appears headed for a climatic encounter on a fourth inside of one year. It pits the largest of the combination passenger-cargo-mail carriers—American Airlines—against the combined interests of the two largest cargo-only carriers—The Flying Tiger Line and Slick Airways.

Perhaps more significant, the struggle is leading to a show-down on the highly important question of whether isolated types of air service, such as cargo operations, benefit the public most when performed by carriers concentrating solely on a single type of service or by carriers mixing all types of service.

Currently, American and Slick-FTL are clashing in three major areas:

• **The freight rate field,** in which CAB recently voted in favor of the two cargo lines by directing the industry to show cause why minimum rates should not be hiked 25%;

• **The Post Office Department's** new experiment in transportating first-class mail by air, in which American and other such carriers strongly oppose the bid of Slick-FTL for CAB authorization to participate;

• **The Slick-FTL merger case,** in which the two lines seek to consolidate their systems into one giant cargo system.

In each of these three cases it is clear that American and Slick-FTL are gearing themselves for the showdown fight next year when the temporary five-year certificates of the all-cargo lines come up for renewal before the CAB.

Arguments exchanged thus far are clear in their implications. For example, in opposing the Slick-FTL proposal to get in on the "first-class mail by air" experiment, AA advanced this far-reaching and critical conclusion: ". . . the present effort of Slick and Flying Tigers to carry the mail can be viewed as nothing else but a demonstration that the all-freight experiment is a failure and these carriers are seeking other classes of traffic to stay in business."

This, retaliated the Tigers and Slick in a joint reply, "is nothing more or less than a gratuitous piece of business slander." Such exchanges are typical of many aired during the past eight months.

In the freight rate field, it appears Slick-FTL will come out victorious in their year-old fight to "increase rates to off-set increased costs." Twice the two lines sought to effect increases in their rates. Once, earlier this year, American stood pat on its structure, and the cargo lines withdrew their proposals, not anxious to accept the competitive disadvantage that would be theirs if they charged higher rates than American.

In August the procedure was repeated and, with American reluctant to go along, appeared headed for the same result. But this time Slick filed a formal motion with the CAB urging the Board to increase the four-year old minimums, a move which would compel American and others to hike their tariffs. FTL joined in the request. American objected.

On the side-lines were United, TWA, and certain other scheduled lines who were apparently willing to increase their rates if it were done on an industry-wide basis.

In this situation CAB directed the industry to show cause why the same increase proposed by Slick should not be effected. Despite the broadness of the order, it applied specifically to American. The old minimum rates were 16¢ per ton-mile up to 1000 ton-miles and 13¢ beyond that. The new floor involves rates of 20¢ and 16.25¢ per ton-mile at the same break-point of 1000 ton-miles.

Three Points from Slick

Slick's president Thomas L. Grace made these significant points in a recent Los Angeles speech on the freight rate issue:

• "The sound development of the airfreight industry is possible now, but it can't be done on a by-product basis. Rates for airfreight cannot be set on a by-product basis either.

• "Airfreight rates must cover the full costs of carrying air freight in all-cargo aircraft and cannot be set on the theory that freight receives a free ride in a passenger plane.

• "Any other policy means that Slick and any other carrier trying to make airfreight a profitable business are doomed."

The Board's action reflected this view of the situation: "The fact that current yields for all-cargo carriers are so close to the minimums indicates that such minimums may no longer be effective to prevent competition from holding rates below the current cost of carriage in all-cargo planes.

"The financial reports of the two major all-cargo carriers indicate that Flying Tiger is barely breaking even on their scheduled freight operations while Slick appears to be suffering substantial losses. In the case of Slick, at least, it appears that the need for prompt rate relief is urgent."

Although avoided by CAB, however, the situation was alive with the theoretical question of whether the cargo rate structure should be geared to the cost of an all-cargo operation or a mixed-service operation. In favoring Slick in its recent order, CAB wasn't deciding that all-important question. Instead it was influenced by the possibility that Slick and FTL might not survive under present rates, a possibility made very real to the Board during its consideration of the matter.

Thus, CAB itself deferred action for next year's certificate renewal battle.

Meanwhile, American—this time with the support of United, TWA, and Capital—offered strong resistance to the Slick-FTL proposal to transport surface mail at special PO rates. On October 6, the four "all-purpose" carriers were to begin an experiment in the New York-Chicago and Washington-Chicago markets carrying first-class mail on a space available basis.

It was in this situation that American recalled testimony of Earl Slick five years ago when he said: "We have no thoughts as to transporting either mail or passengers. We believe in transporting freight; believe that it is self-sustaining, and that it will be unnecessary to ask for passengers or mail."

The two cargo lines fought back and as this issue went to press the question was before CAB as to whether it could and should grant the necessary authorizations.

The Slick-FTL merger case, despite the opposition of American, has moved smoothly along. An examiner's report is due at any time and final CAB decision is possible within two months.

But each development has offered the clashing airlines numerous opportunities to get arguments on the record and before the public on the big question to be decided in the renewal case next year.

• • •

Airline Commentary

By Eric Bramley

AIRLINES are considering a new method of handling inter-line baggage at Chicago's Midway Airport. Arrangements aren't completed yet, but if it goes through it'll be a brand-new system not now used, as far as we know, at any other airport. We spent an afternoon recently wandering around Midway, watching operations. Our conclusion was that an inter-line passenger with even a loose connection is lucky to get his bag transferred. Airlines are to be commended for doing as good a job as they do with such a sprawled-out set-up. The new system can help considerably. We'll bring you details when available.

•

Use of local time in domestic timetables during the recently ended daylight savings season was an outstanding success. American Airlines, which deserves a lot of credit for pushing the idea, reports that out of 1786 passengers answering a questionnaire, 1685 (94.3%) favored local time. We thought it was a vast improvement—and trust that it's now a permanent airline practice.

•

Speaking of inter-line baggage, here's a story that's a complete reversal of the Chicago situation. It's the sad tale of **Joe Murphy,** AMERICAN AVIATION's technical editor. Joe was flying from one midwest city to another, where he was to connect with a Washington trip of the same airline. Space was confirmed; connection was 15 minutes. The originating trip was a little late; it arrived at 9:05 p.m., and the connecting flight left at 9:15. Joe hustled off the plane and into the terminal, hitting the ticket counter at 9:08, just after the final call had been made for the Washington trip.

The agent expressed regrets, said the flight was closed out, and wouldn't do anything about it. Argument got Joe nowhere; he gave up and asked for his baggage. To his amazement, the bag had been transferred on the ramp and was merrily on its way to Washington! Which led Joe to make the sarcastic and somewhat classic remark that if the airlines did as good a job with connecting passengers as their porters did with baggage, this would be a better world in which to live.

And which leads us to wonder just how stupid can an airline get? This was an on-line transfer—not inter-line. Didn't anyone know a connecting passenger was arriving? Why wasn't provision made for his quick transfer? This airline probably does a lot of moaning about no-shows, misconnects, etc., yet it muffs an on-line connection. How much revenue is going out the window each month?

•

A station manager, commenting on our observation that airlines must maintain some semblance of passenger service in connection with coach trips, says we've touched "a very sensitive spot in our industry." He believes the "solution lies in the man performing the check-in duties, and his ability can materially affect the profit or loss of the airline. Yet this man presents a great turnover problem . . . You rarely find an employe with more than a few years of experience except in smaller stations where other factors keep him satisfied. This turnover is a result of insufficient recognition of the importance of the job by the airlines, and the generally inconsiderate attitude of the traveling public toward the airline employe."

•

ODDS AND ENDS: About a year ago we spoke before Air Traffic Conference's ticketing and baggage committee on the need for **uniform check-in procedures.** A subcommittee has been working on the project, now reports that progress is being made . . . Same committee is making a concerted effort to see that all airlines **collect for excess baggage** . . . We hear very favorable comments on **TWA's Ambassador** as being one of the top de luxe transcontinental flights . . . **Benny Griffin,** manager of Washington National Airport, tells us that almost **2.5 million gallons of gasoline** are distributed at the field every month. About 1.5 million gallons are kept on hand at all times.

SOUTHERN CALIFORNIA
Aviation
HEADQUARTERS

★ AVIATION ROOM
Home of the "Q.B's"
★ AIRLINES CENTER
American, Pan-American, TWA and Western Airlines Ticket Offices.
★ AIRPORTRANSIT
Exclusive Hollywood Stop
★ AIRCRAFT MFG. CENTER

The "Islander"
Cinegrill ★ Garden Grill
Heated Swimming Pool
Hull Hotels
A TRADE NAME FIRMLY IN THE WEST
Hollywood ★ ★
ROOSEVELT
★ ★ ★ Hotel
7000 HOLLYWOOD BLVD. HOLLYWOOD 28, CALIF
• PHONE HO 9-2442 • TELETYPE LA 547
THOS. E. HULL, President L. B. NELSON, General Manager

BIG or SMALL
they all

SHINE BEST
SHINE LONGER
SHINE EASIER with
NEVR-DULL
Aluminum Cleaner and Polish

The original chemically-impregnated cotton wadding — Cleans quicker, gives higher, longer-lasting gloss, leaves protective film. Saves time, labor and money! Avoid inferior imitations.
AVAILABLE AT LEADING DISTRIBUTORS
MANUFACTURED EXCLUSIVELY BY
George BASCH Co.
559 Longfellow Avenue, New York 59, N. Y.

People

MANUFACTURING

Kenneth G. Farrar has been advanced from works manager of the Douglas Aircraft Co's Long Beach Plant to division general manager to fill the vacancy created by the recent death of **James Simpson.**

Robinson Aviation, Inc., recently announced the following shifts in its management: **Arthur G. Ranslow,** from production manager to vice president of production; **Charles R. Davis,** from head of the company's west coast engineering office to vice president of the west coast district; and **H. Erich Nietsch,** from assistant to the president to Industrial Division manager.

Capt. John Warburton King, who retired from the Navy in June after 30 years of service, has been named assistant to the president of the Stroukoff Aircraft Corp.

William J. Cunningham, formerly with Dumont Aviation Associates, has been named an assistant sales manager of Greer Hydraulics, Inc.

B. R. Fondren of Menasco Manufacturing Co. has been promoted to vice president of finance. Fondren will continue to serve as the firm's secretary and treasurer. Other Menasco organizational changes find: **Carl H. Kalbfleisch,** elected to be a vice president; **T. J. Tormey,** elected an assistant secretary of the corporation; and **D. M. Lefmann,** elected an assistant treasurer of the corporation.

Ernest G. LeMay, Jr. has been appointed president and general manager of the Century Controls Corp. Farmingdale, N. Y.

Rader

LeMay

Dr. Louis T. Rader has been named to head General Electric's Specialty Control Department at the firm's Schenectady Works. Beside Dr. Rader as general manager, the newly created department will have: **K. N. Bush,** manager of manufacturing: **H. L. Palmer,** manager of engineering; **J. P. Rutherford,** manager of marketing; and **C. S. Van Wormer,** manager of finance.

William Paul Youngs, former Curtiss-Wright executive and onetime Pan American Airways pilot, has been appointed vice president of sales by Aircraft Supplies, Inc., of Nutley, N. J.

AIRLINES

W. E. Huskins has been appointed administrative assistant to **Frank C. Judd,** operations vice president for Northwest Airlines and **R. C. Zinn,** onetime aircraft service superintendent for Pan American World Airways' Latin American Division, has been appointed NWA's aircraft services director.

Paul W. Pate of Delta-C&S Air Lines, has been promoted from manager of cargo to director of properties, succeeding **John W. Taber,** resigned. **John R. Pogue,** superintendent of cargo sales for the airline"s western division, has been moved up to manager of cargo sales.

H. Laird Loftis has been named interline and agency officer for the North American Sales Division of British Overseas Airways Corp.

The following employes recently completed 20 years, or more of service in the aviation industry.

- **Frank Bitzko,** Pratt & Whitney Aircraft. Lathe operator, East Hartford. 25 years.
- **Morris Triggs,** Pratt & Whitney Aircraft. Distributor liaison, East Hartford. 25 years.
- **Howard Cox,** Pratt & Whitney Aircraft. Cutter inspector, East Hartford. 25 years.
- **R. F. Meardon,** American Airlines. Ass't regional maintenance superintendent, New York. 25 years.
- **C. R. Smith,** American Airlines. President, New York. 25 years.
- **Charles Lawson,** Pratt & Whitney Aircraft. Master mechanic, East Hartford. 25 years.
- **Guy E. Beardsley,** Pratt & Whitney Aircraft. Development engineer, East Hartford. 25 years.
- **Bill Irwin,** Pratt & Whitney Aircraft. Tool liaison man, East Hartford. 37 years.
- **Albert Lustig,** Chance Vought Aircraft. Quality control leadman, Dallas. 25 years.
- **Jack Hospers,** Chance Vought Aircraft. Assistant to the general manager, Dallas. 25 years.
- **Ludwig Reichert,** Chance Vought Aircraft. Experimental shop superintendent, Dallas. 25 years.
- **Edmund T. Price,** Solar Aircraft Co. President and general manager, San Diego. 25 years.
- **J. R. Tidball,** United Air Lines. Flight dispatcher, Denver. 20 years.

NOW Continental's 3200 MILE SYSTEM AND 3 INTERCHANGES SERVE MAJOR CITIES THROUGHOUT THE WEST

Continental's 40-city system is served by a modern fleet of DC-6-Bs, Super Convair 340 s, and DC-3 s. Interchanges with American, Braniff, and United Air Lines provide Through Services to Arizona and California, St. Louis, and the Pacific Northwest.

Continental AIR LINES

CONTINENTAL AIR LINES

World War II Veteran

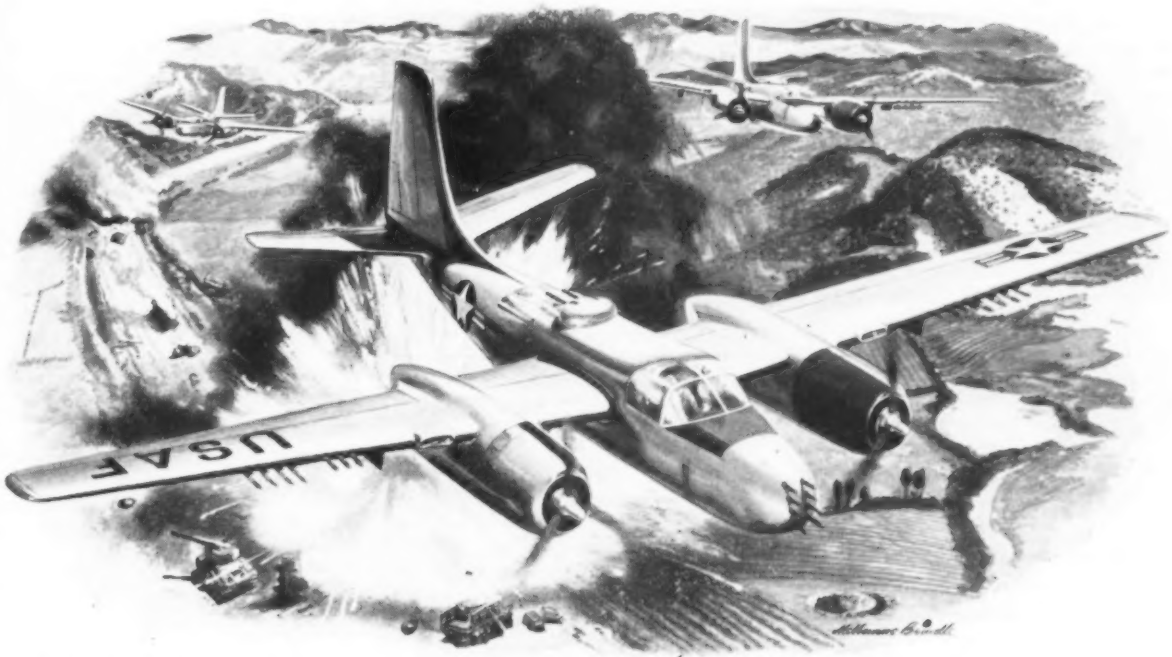
holds its own in the new jet age

the Douglas B-26 Invader

During World War II, over both Europe and the Pacific, the Douglas B-26 Invader spearheaded major allied advances. It was still the standard USAF light bomber when war broke out in Korea.

Laminar-flow, high-speed wing design gives Invader the speed and maneuverability of a piston-engine fighter. With 3-man crew and 6,000-lb. bomb load, combat radius is over 900 miles. Firepower is crushing... sixteen .50 caliber machine guns, fourteen of them in the nose and wings. In Korea, despite the advent of fast new jets, Invader's agility and heavy armament have made it a mainstay in advanced, low-level ground support of our troops.

Performance of the B-26 Invader is another example of Douglas leadership. *Faster and farther with a greater payload* is a basic rule of Douglas design.



Enlist to fly in the U. S. Air Force

Depend on *DOUGLAS* **First in Aviation**

CAB Weighs New Southern Interchange

CAB has again taken under advisement the question of whether Braniff, Eastern, and TWA should be permitted to operate a southern transcontinental interchange service in competition with a similar service now provided by National, Delta, and American.

It has been two years since the Board weighed the problem, a period during which proponents claim traffic has doubled. CAB in 1951 suggested the interchange, approved it, and then was forced to reopen the case when National secured a stay order in a Washington Court.

At the time of original approval, CAB noted that there was "ample traffic" to support the second through service. Now, said Braniff's Hubert A. Schneider, "our case is twice as strong."

TWA's James Crimmins and Eastern's E. Smythe Gambrell at a recent oral argument before the Board criticized the "American monopoly" on traffic to and from the west coast from Texas and Florida.

But, at least in numbers, the three lines were edged in the CAB battle. Four airlines—American, Delta/C&S, National, and Continental—plus CAB's bureau of air operations and Board Examiner William J. Madden, opposed the new service.

Generally the argument of opponents was that there isn't enough traffic to support the new service, diversion would be great, and that some lines like Continental may have to have increased subsidy.

Allegheny Asks for Lake Central Routes

Allegheny Airlines has asked CAB to enlarge the current Lake Central Acquisition Investigation to consider it as a possible transferee for all or arts of LCA's routes. The move has yet to be acted on by the Board, but already has been termed a "dismemberment" move by LCA and its majority stockholders.

Lake Central is currently operating under a temporary trustee-type management pending outcome of the CAB investigation which will decide to what carrier or carriers ownership of the line should be transferred or sold. Presently being considered in this light are North Central, Ozark, and the Toledo group of businessmen known as Transport Airgroup, Inc.

LCA and its majority stockholders oppose any change in the case which would permit transfer of the routes without necessary sale of the stock. In fact, they contend, the major point CAB has to decide is who gets the stock with the route transfer an incident thereto.

Allegheny's proposal, meanwhile, is two-pronged. It wants to be considered for LCA's routes but does not want its proposal to preclude a possible deal under which several local lines, including Allegheny, may buy out the majority interest in LCA and split the routes among themselves.

CAB Miscellany

Kenneth J. Greening d/b/a Kansas City Helicopter Service applied to CAB for a certificate to conduct scheduled helicopter services within a 60-mile radius of Kansas City.

•

Riddle Airlines and Trans Caribbean Airways have asked for authority to operate "sky-bus" service on a scheduled basis between the U.S. and Puerto Rico.

•

National and Delta/C&S asked CAB to reverse a decision in which it approved Eastern's use of 88-seat Super Constellations in daylight coach service.

•

Overseas National Airlines wants CAB to revoke operating authority of Seaboard & Western or hold hearings on S&W's "failure" to present its case when called in the Large Irregular Investigation.

•

Lineas Aereas Costarricenses, S. A. (LACSA) has been recommended for a three-year renewal of its Miami-Costa Rica foreign permit by CAB's air operations bureau.

CAB News

The **Trans-Pacific Renewal Case** and the **Trans-Atlantic Cargo Case** have each passed another procedural hurdle—briefs to the examiner. These sum up the carriers' cases and pave the way for examiners' recommendations to the Board. Both cases are several months away from final CAB decisions, however, and, being international proceedings, will require White House approval.

The **Colonial Airlines Merger Proceeding** (at press-time) was in the White House for Presidential action on CAB's decision favoring a Colonial-Eastern merger. It was transmitted by CAB in mid-September.

After a summer-long court fight over whether CAB can go ahead with hearings in the **North American Airlines Enforcement Case** (which CAB recently won), the parties may stipulate information into the record to eliminate or at least minimize the hearings. But the over-all case won't be decided for several years.

Ripe for an early decision, however, is the **Reopened Southern Service to the West Case** in which oral argument was heard last month on the proposed second southern transcontinental interchange service via Eastern, Braniff, and TWA.

RECENT CAB DECISIONS

• **Eastern Air Lines** and Piedmont Aviation made parties to new investigation into need for new airline service between Charleston, W. Va., and Columbus, O.

• **International Air Transport Association** resolution establishing a permanent subcommittee on fares, rates, and charges to shorten length of Traffic Conference meetings approved.

• **Pioneer Air Lines'** proposed establishment of a "spin-off" corporation (Pioneer Aeronautical Services, Inc.) to which it will transfer its Martin 2-0-2 fleet approved.

• **American Airlines'** proposed Boston coach fares suspended for additional 90-day period beyond September 25 to December 24, 1953.

CAB CALENDAR

Oct. 12—Hearing in Aerovias Sud Americana-North American Food Carriers Acquisition Case. Washington. Docket 6245.

Oct. 12—Hearing in Short-Haul Coach Fare Investigation. Washington. Docket 6098 et al.

Oct. 19—Hearing in States-Alaska Service Case. Anchorage, Alaska. Docket 5756 et al.

Oct. 21—Hearing in Reopened Samoan Airlines Case. Washington. Docket 4579.

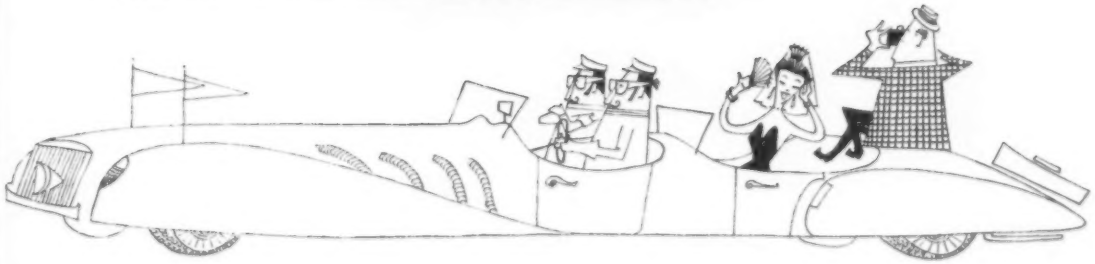
Oct. 27—Hearing resumed in Bonanza Air Lines Renewal Case. Washington. Docket 5773 et al.

Nov. 2—Hearing in New York-Chicago Service Case. Washington. Docket 986 et al.

in

RIO

Braniff makes the difference



Ah, Rio! You wouldn't think such a wonderful city could be made even more so—but it's a fact for folks who fly Braniff. Maybe your clients want a valuable tip on where to find the most amazing aquamarines. We know a broker with an office full of them! Maybe their Portuguese is rusty, can't seem to set up that jaunt to Quitandinha. We'll handle it and gladly. Maybe all they need is a hearty welcome and a helping hand when they land in the big middle of Brazilian customs. We're Johnny on the spot. Even world travelers, we find, appreciate and commend our highly specialized service down south!

it's

BRANIFF

INTERNATIONAL AIRWAYS

Love Field • Dallas, Texas.

INTERNATIONAL AVIATION

Edited by Anthony Vandyk

INTERCOM

A financing company is being formed in London to help the British aircraft industry get additional business, particularly in the export market, by enabling manufacturers to offer extended credit terms. Known as Air Finance Ltd., the company is sponsored by several well-known financing houses and its issued capital of $2,800,000 will be subscribed by them and by leading firms of the British aircraft industry. It will also be able to get special loan facilities of up to $28 million from one of its sponsors, the Finance Corporation for Industry, and will have the "co-operation" of the British government's Export Credit Guarantee Department.

Formation of Air Finance Ltd. reflects the difficulties certain aircraft companies in Britain have been having recently in increasing borrowings from banks and the capital market for the purpose of lengthening export credit terms. Last year the chairman of de Havilland's pointed out how formidable, at present-day costs of aircraft, was the task facing the manufacturer in arranging production at any adequate rate unless backed by sufficient orders. He said that the sums involved were such as had hitherto been appropriate only to the shipbuilding industry (where production was not normally embarked upon except against definite orders).

•

British European Airways carries more passengers than any other airline outside the United States. It also loses more money than any airline in the world due to its short routes and exceptionally marked traffic peaks and valleys. In its last fiscal year (ended March 31, 1953) the corporation sustained a net loss of $4,085,566 despite capacity ton-miles increasing 22% over the previous year, total revenue increasing 21%, and the break-even load factor dropping 4% (to 68%). Introduction of aircraft with greater earning capacity should make this year's balance sheet look better. In the past 12 months the earning capacity of its various types has varied from $630 per flying hour for each Viscount (at an achieved load factor of 71%) down to $39 for each Dragon Rapide (at a 64% load factor). The other aircraft in the BEA fleet measured up as follows: Ambassadors (Elizabethans), $435; Vikings, $217; passenger DC-3's, $176; freighter DC-3's, $140.

De Havilland Publishes Comet III Costs

BOAC reports that its Comet operations in the fiscal year through March 31, 1952 showed a profit of $95,000 "after covering all costs including full route-proving and training expenses spread proportionately over the life of the aircraft, and interest on capital." Meanwhile de Havilland's has published the following direct operating costs for the Comet III, the version of the British jet transport ordered by Pan American World Airways.

	Dollars per aircraft flying hour		Cents per long ton-mile of payload	
Obsolescence				
Airframe	68.60		1.6324	
Power plants	17.64		.4664	
Insurance	38.08	124.32	.9328	3.0316
Maintenance and overhaul:				
Airframe	57.12		1.3992	
Power plants*	112.00	169.12	2.7984	4.1976
Fuel and oil	252.28		6.1798	
Cockpit crew	27.72		.6996	
Landing fees	18.48	298.48	.4664	7.3458
Total direct operating cost		591.92		14.5750

* The first overhaul costs for the power plants are taken at 25% of their first cost (maintenance costs which are small compared with the overhaul costs are also included in this figure).

Scottish Aviation Twin Pioneer feeder transport (AMERICAN AVIATION, December 22, 1952) prototype is due to fly next year and its manufacturer is preparing for an initial production run of 100 aircraft at a selling price of $98,000 each. The most interesting feature of the Twin Pioneer, and the main reason why Scottish Aviation is optimistic about sales prospects, is its unusual take-off and landing performance. Although it will cruise at 150 mph, the Twin Pioneer's designed stalling speed (engines off) is 47.5 mph and its airborne speed is 48 mph. In extreme conditions a 300-foot landing strip, with good approaches, would suffice; 750 feet would be "luxury" treatment according to Scottish Aviation. Powered by two 550-hp Alvis Leonides engines, the Twin Pioneer can carry up to 30 passengers or 4250 pounds of payload over a 100-mile stage length, or 3300 pounds for 500 miles. An operating cost of 2½¢ per mile is claimed for the Twin Pioneer, but Scottish Aviation emphasizes that a comparison of cost with other aircraft is not so important to the places which the Twin Pioneer is intended to serve, since for these places it is likely to be a case of the Twin Pioneer or no fixed-wing aircraft—and Scottish Aviation believes that even when a twin-engine helicopter of similar capacity is available, the cost to the traveler is likely to be four or five times greater than that of the Twin Pioneer. The firm is located at Prestwick Airport, Prestwick, Scotland.

Can you see the BIG difference?

On the face of it, Avien's Two-Unit Fuel Gage looks like previous systems, but there's a big and important difference behind it all.

Behind this Avien dial face (shown here three times actual size) is Avien's brand-new concept of fuel gage system "packaging."

Previously, you'd find these units behind a dial: an indicator case, motor and balancing potentiometer; and elsewhere a bridge-amplifier, a shockmount and a tank unit.

Now, in the Avien Two-Unit Gage, the necessary components for the bridge and amplifier functions have been built right into the indicator case.

The result: a fuel gage system of "plug-in, plug-out" simplicity, which weighs 50% less and eliminates the need for any field calibration.

What a BIG difference this makes in money!

First of all, the basic system costs less. Less time is spent in installation. Less wiring and connectors are needed. Less maintenance is required, because there are fewer components to maintain. Trouble-shooting time is cut for the same reason. And fewer parts must be stocked for maintenance and repairs.

Because of this new package, Avien gages are now "shelf items." They're completely interchangeable in the aircraft for which they are designed.

Additional functions for fuel management can be easily integrated into the basic Two-Unit system.

The Avien Two-Unit Fuel Gage is now available to meet your production programs. The indicator is available in either large or small sizes, with all varieties of dial configurations.

Every month, Avien produces over ten thousand major instrument components for the aviation industry.

The Avien Two-Unit Fuel Gage will make such a BIG difference in your cost sheet, we suggest that you write or call for more information today.

Avien

AVIATION ENGINEERING DIVISION

AVIEN-KNICKERBOCKER, INC.

58-15 NORTHERN BOULEVARD, WOODSIDE, L. I., N. Y.

INTERNATIONAL AVIATION

MANUFACTURING

NETHERLANDS: Koolhaven is negotiating with France's Max Holste company to build the MH 1521 Broussard utility plane under license. Dutch firm has also been negotiating to build another French plane—the SIPA 200 Minijet.

FRANCE: SNCA du Nord closed its Le Havre plant on October 1 due to lack of orders. It recently built 25 Nord 1400 amphibians for the French Navy and more than 100 NC 856 spotter planes. It also built components for the Nord 2501 transport, about 120 of which are on order.

AIRLINES

GERMANY: The Lufthansa will have its base at Hamburg; choice lay between that city and Munich.

NORWAY: Fred Olsen, a major independent, has ordered two Viscounts.

BRITAIN: BEA will soon inaugurate experimental helicopter service between London Airport and downtown London using Bristol 171's. For safety reasons the single-engine craft will follow the River Thames to the center of London and will land on a platform mounted on barges in the river.

INDIA: Air India-International will open a Bombay-Calcutta-Hong Kong-Tokyo route in mid-1954 following delivery of its Super Constellations.

NETHERLANDS: KLM now operates all its Amsterdam-New York flights with two-class Super Constellations.

PAKISTAN: Nationalization of the air transport industry is in the works. There will probably be a single carrier which will take over Orient Airways operation within the Indian subcontinent and next spring will inaugurate service to Europe (Zurich, Paris, and London) with three Super Constellations.

FRANCE: Traffic between France and Algeria is to be shared 55% and 45% between Air France and Compagnie Generale de Transports Aeriens Air Algerie, respectively, the French government has decided.

BELGIUM: SABENA's passenger helicopter service is proving particularly popular in the Netherlands. Bookings are heavy between Rotterdam, Antwerp and Brussels. The same fare per mile is charged as on ordinary tourist services, but helicopter passengers are allowed only 22 pounds free baggage allowance.

CEYLON: Restriction on frequency of operations by foreign carriers have been lifted by the government following the discontinuation of long-distance international services by Air Ceylon. Air France and KLM are reported interested in starting service to Ceylon.

MILITARY

BRITAIN: Following the winding up of the RAF's pilot training scheme in Southern Rhodesia, 140 North American T-6 Harvards and 62 DH Chipmunks are being offered for sale in Bulawayo.

FRANCE: General Fay has been named chief of air staff in place of General Lecheres who is retiring.

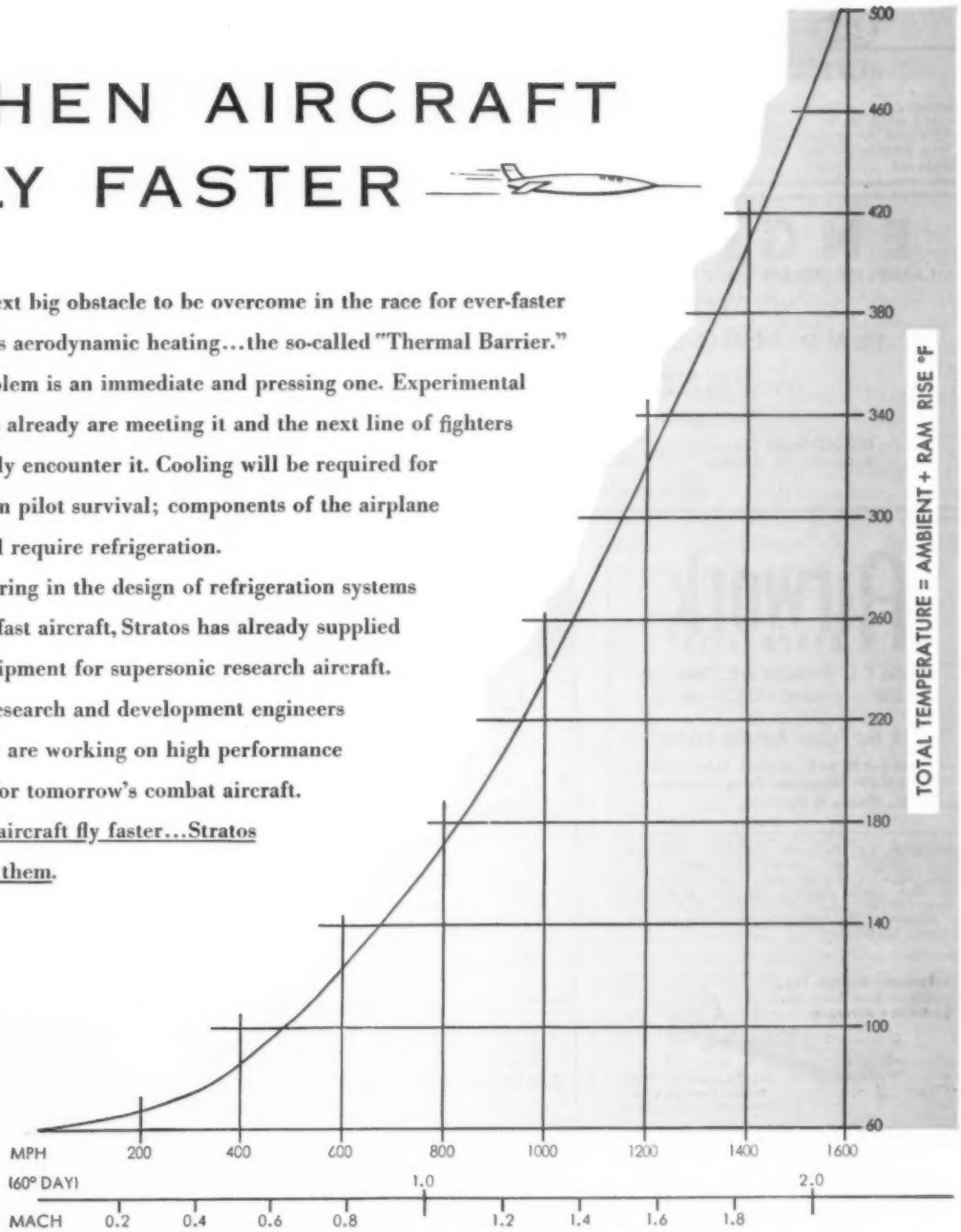
Central Terminal Area of London Airport will be completed by January, 1956, and will comprise three large buildings: a Central Control Building, due for completion in July, 1955; a Passenger Handling Building, to be opened in September, 1955; and the Eastern Apex Building (with space for the handling of aircraft operations and crews and for public amenities such as an exhibition hall and a newsreel theatre), which will be ready by January, 1956.

WHEN AIRCRAFT FLY FASTER

The next big obstacle to be overcome in the race for ever-faster aircraft is aerodynamic heating...the so-called "Thermal Barrier." The problem is an immediate and pressing one. Experimental airplanes already are meeting it and the next line of fighters will surely encounter it. Cooling will be required for more than pilot survival; components of the airplane itself will require refrigeration.

Pioneering in the design of refrigeration systems for very fast aircraft, Stratos has already supplied such equipment for supersonic research aircraft. Stratos research and development engineers currently are working on high performance systems for tomorrow's combat aircraft.

When aircraft fly faster...Stratos will cool them.



STRATOS

A DIVISION OF FAIRCHILD ENGINE & AIRPLANE CORP.

Main Office and Plant: Bay Shore, L. I., N. Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles 24, Calif.

TYPICAL STRATOS PRODUCTS

REFRIGERATION TURBINE FOR F-86 "SABREJET"

REFRIGERATION PACKAGE FOR B-47 "STRATOJET"

AIR-TURBINE DRIVE FOR OPERATING ACCESSORIES

BOOTSTRAP COOLING UNIT FOR TRANSPORT AIRCRAFT

CABIN SUPERCHARGER FOR TRANSPORT AIRCRAFT

THE BULLETIN BOARD

Undisplayed Advertising: $1.00 per line, minimum charge $4.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.
Displayed Advertising: $15.00 per column inch. Space units up to full pages accepted in this section for classified-type advertising.
Forms close three weeks preceding date of issue. Address all correspondence to Classified Advertising Department, American Aviation Publications, 1025 Vermont Ave., N. W., Washington 5, D. C.

ENGINE WORKS

LAMBERT FIELD INC. ST. LOUIS, MO.

will OVERHAUL and CONVERT your

P&W R 1830-92 Into 1830-SUPER-92

ONLY $5500 with all new cylinders, pistons, pins, rings, etc.

20°-40° Cooler Running

700 HP Easy Cruise
Safer Single Engine
Less Fuel per Mile
Lower Maintenance Costs

Write or call CAbany 5428

Airwork CORPORATION

Millville, N. J. 1750 | Washington, D. C. Jackson 4-1212 | Miami, Fla. 88-3467

CAA and Factory Approved Overhaul

R-985-AN-14B $3150.00 Sale Price—$2550.00 Exchange Price including Carb., Mags., & Harness.

Available 10 October: Airline Transport Pilot, DC-3/C-46, Comm. priv. Me-L, B-25/A-26, Se-L & Se-S, flight instructor, 3900 hrs., 800 single engine, 250 hrs. WX, 2 yrs. college, 3 yrs. CAA A.R.T.C., married. Aubrey A. Sweezey, 141 Winter St., Framingham Center, Mass.

Remmert-Werner, Inc.
Lambert Field, St. Louis, Mo.
Executive Aircraft

DC-3 Lodestar D18S
Complete Services & Sales
Conversion-Maintenance-Parts

FOR SALE—HILLER HELICOPTER

Model UH12A. Mfd. April 1950—Total time 715 hours. 100 hours since major on Airframe and Engine. Includes Agricultural Spray Equipment. Excellent condition.

EAST COAST AVIATION CORPORATION
Lexington 73, Massachusetts

IMPROVED HANGAR
198' WIDE BY ANY LENGTH
WE WILL ERECT ANYWHERE
GEORGE D. WIDMAN, Inc.
17823 Evelyn Ave. Gardena, California
MEnlo 4-3127 - Plymouth 4-2949

IMMEDIATE DELIVERY

LODESTAR

Completing zero time overhaul. Interior—Engines—Radios—optional

•

Jackson 7579
111 W. 85th Street
Kansas City 14, Missouri

TWIN BEECHCRAFTS
C18S and D18S Transports—Excellent Condition fully equipped from $25,000
LODESTAR EXECUTIVES
Why take less for your money?
Ready to go complete from $55,000
We Invite Inquiries for Any Types
WINGS, INC. **Ambler, Pa.**

NAVCO, INC.
Lambert Field
St. Louis, Mo.
TErryhill 5-1511
Has in Stock Today
Collins **17M** 50 watt 360 Channel VHF Transmitter
with Mount, Control, Power Unit, F.E.T. $2883

Government certified specialists in hard chrome plating and grinding to specifications silver, lead, indium, tin, copper and modifications of Pratt Whitney Aircraft engine parts, tin and tin lead on Wright Aircraft engine parts. CREWS ELECTRO PLATING COMPANY, 252 N. W. 29th Street, Miami, Florida.

WANTED

A&E Mechanics for Line Maintenance—Instrument Overhaul Mechanics— 2nd Class Radio Mechanics—DC-3/C-47 Aircraft.

Write: **ALLEGHENY AIRLINES**
Director of Maintenance
Washington National Airport
Washington, D. C.

DOUGLAS PARTS
DC3—DC4

Fuselages - Wings - Nose Sections Ailerons - Flaps - Rudders - Landing Gears - Wheels - Dem. Power Plant Units - Doors and other items as well as all component airframe parts.

Transport Aircraft—Engines—Airline Equipment
A. K. ROZAWICK, Pres.

AIRLINE EQUIPMENT CORP.
SUITE 704 - ROCKEFELLER CENTER
610 FIFTH AVE., NEW YORK 20, N.Y.
Circle 5-6920-6921
NEWARK AIRPORT NEWARK, N.J.
MARKET 2-0963-4

OPEN TIME on **KELLER** Automatic Tracer-controlled duplicating equipment. We specialize in contour milling, profiling, metal core boxes and patterns, plastic molds, cores and forces, and precision machining of castings used in molding of reinforced fiberglass. Our equipment will accommodate work up to and over 7 ft. x 4 ft. A. E. Paxton, 57-17 79th Ave., Brooklyn 27, N. Y. HEgeman 3-7080.

BOOKS FOUND! Free world-wide search service. Aviation history and literature a specialty. Fast service—reasonable prices. Send wants—no obligation. International Bookfinders, Box 3003-AA, Beverly Hills, Calif.

FOR SALE

54 Douglas Seats

Just Removed from a Delta DC-4
Good Condition

Contact:

GREAT LAKES AIRLINES, INC.
Lockheed Air Terminal
Burbank, California
Phone-Charleston 0-0483

AIRLINE EXPERIENCE AVAILABLE—I am 32 and have been seven years with present employer, principal U. S. International Airline, as Station Manager, Traffic-Sales Agent, Publicity-Pub. Rel. Director, Asst. to Division Manager. Complete resume upon request. Box 829, AMERICAN AVIATION Magazine, 1025 Vermont Avenue, N. W., Washington 5, D. C.

AIRLINE CAPTAIN over 12,000 hours. All types of equipment. ATR—A & E—instructor. Experience over water and foreign countries. Desires position as executive pilot. Willing to travel anywhere. Single. Excellent references. Age 41. Box 828, AMERICAN AVIATION Magazine, 1025 Vermont Avenue, N. W., Washington 5, D. C.

Make this space work for you!

ADVERTISERS INDEX

Aero Design & Engineering Company 41
Aerotherm Corporation, The 73
Air Associates, Inc. 88
AiResearch Manufacturing Company 43
Allison Engine Division,
General Motors Corporation 28
American Airlines, Inc. 66
American Cystoscope Makers, Inc. 34
Aviation Engineering Division,
Avien-Knickerbocker, Inc. 81
George Basch Company, The 75
Beech Aircraft Corporation 51
Bendix Aviation Corporation,
Eclipse Pioneer Division 7
Scintilla Magneto Division 21-89
Braniff Airways, Inc. 79
Bulletin Board (Classified) 84
Chase Aircraft Company, Inc. 72
Continental Air Lines, Inc. 76
de Havilland Aircraft of Canada Ltd., The 36
Delta-C&S Air Lines, Inc. 27
Douglas Aircraft Company, Inc. 77
Fairchild Engine & Airplane Company
Fairchild Aircraft Division 34
Stratos Division 83
Flightex Fabrics, Inc. 36
General Electric Company 31
Gilfillan Bros, Inc. 25
Goodall Fabrics, Inc. 35
B. F. Goodrich Company, The 12
Grand Central Aircraft Company 11
Hollywood Roosevelt Hotel 75
Kollsman Instrument Corporation 48
Lear Incorporated 9
Lockheed Aircraft Corporation 58-59
Marquette Metal Products Company,
Subsidiary of Curtiss-Wright Corporation 87
Minneapolis-Honeywell Regulator Company 2
Monsanto Chemical Company 5
North American Aviation, Inc. 3
Northrop Aircraft, Inc. 69
Pan American-Grace Airways, Inc. 55
Philippine Air Lines 29
Phillips Petroleum Company 90
Pratt & Whitney Aircraft Division,
United Aircraft Corporation 46-47
Rheem Manufacturing Company,
Aircraft Division 68
Sinclair Refining Company 70-71
Southwest Airmotive Company 45
Standard Piezo Company 37
Summers Gyroscope Company 61
Temco Aircraft Corporation 32
Trans World Airlines, Inc. 33
Vickers Incorporated 65
Westinghouse Electric Corporation 52-53

Pilot Incompetency Charged by Article

The current issue of *Cosmopolitan* magazine features an article titled "How Accidental Are Air Crashes?" which charges that one out of every seven airline pilots is incompetent or unsafe. A CAA spokesman told AMERICAN AVIATION that statements in the article attributed to CAA Medical Director Dr. W. R. Stovall do not represent an official CAA viewpoint and were the personal opinions of Dr. Stovall. No other agencies have made comments as yet.

Written by Summer Ahlbum, a Newspaper Enterprise Association staff writer, the article charges that an estimated 10% of airline pilots are 'incompetent" and further states that Dr. Stovall is willing to guess that 15% of the airline pilots are physically or mentally unfit to fly.

PHOTO CREDITS

13—Douglas; 15—Boeing; 16—General Electric; 17—Wide World; 24—Weber; 31—UAL; 38, 39, 40—Lockheed; 42, 44—NACA; 49—Raytheon; 57—North American, Solar, Aero Design; 82—Wainwright.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

AMERICAN AVIATION published bi-weekly at Harrisburg, Pennsylvania for October 1, 1953.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Wayne W. Parrish, Washington, D. C.; Editor, Wayne W. Parrish, Washington, D. C.; Managing Editor, William D. Perreault, Washington, D. C.; Business Manager, Leonard Eiserer, Washington, D. C.

2. The owner is: American Aviation Publications, Inc., Washington, D. C.; Wayne W. Parrish, President, Washington, D. C.; Albert H. Stackpole, Vice-President, Harrisburg, Penna.; E. J. Stackpole, Secretary & Treasurer, Harrisburg, Penna.; Leonard Eiserer, Vice-President and General Manager, Washington, D. C.; Eric Bramley, Vice-President and Executive Editor, Washington, D. C.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner.

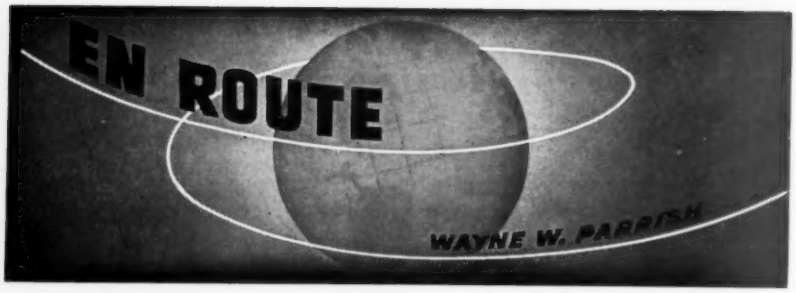
5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 25,261.

LEONARD EISERER,
(Signature of business manager)

Sworn to and subscribed before me this 25th day of September, 1953.

J. RUSSELL SHEFFER,
Notary Public.

(My commission expires March 9, 1955)



An Old Love. I have always looked back on my early love affairs with great tenderness and respect. Those were the joyous, innocent days of pure romance and idealism before **Kinsey** stepped in to take statistics. Really, now, it never occurred to me to question my early girl friends about what they had been doing up in the hay loft.

But to show you what a real memory I've got for sweet faces, I renewed a romance recently which had its origin on a March day in 1931. And believe it or not, this babe is just as sweet today as she was 22 years ago. The location: Madrid, Spain.

Her name is **Lucrecia Baccio del Fede** and she is Italian, probably born and reared in Florence. How I met her and how I remembered where to find her is today's lesson in alertness, good citizenship, and how to be an Eagle Scout.

First Date: 1931. Back in 1931 when I was traveling around Europe third and fourth class on a Pulitzer scholarship, I rattled over Spain's rail system and arrived in Madrid. This was just before the revolution. I roamed over the city, saw my first bull fight, visited the churches and other sights and, above all, spent several days in the Prado, one of the truly great art museums of the world. The Spanish ransacked Europe several centuries ago and brought into Spain art treasures of untold wealth, and the bulk of these are to be seen in that country today.

I carried with me a Baedeker's guide of Spain published in 1913. It was the last of these great German Baedekers published in English on Spain and Portugal and I had borrowed it from the American library in Paris, although I doubt very much if the librarian would have let me take it out if she had known I was going on a five-week jaunt southward. The main point is that scarcely anything changes in Spain and a 1913 guide was perfectly good and usable in 1931.

So I dutifully covered carefully each room and gallery in the huge Prado museum, admiring especially the buxom women painted by **Peter Paul Rubens** which make even the **Jane Russells** of today look a little anemic. Then I came to a room and spotted a face that could mean nothing but love at first sight. It was Lucrecia.

Demure. Lucrecia was a young girl, obviously, and very demure, as the photo on this page shows. She was painted by **Andrea del Sarto**, who lived between 1486 and 1531 in Florence at the very height of the Italian Renaissance. Del Sarto was one of the Florentine school of painters who flourished in the time of **Leonardo da Vinci** and **Raphael** and was noted as a colorist. All I can say is that his painting of Lucrecia made an indelible impression on me. She seemed superbly beautiful. Of course I wasn't so old in those days, so I can't say I was robbing the cradle even in my mind's eye. After all, according to Kinsey, **Juliet** was less than 14 when **Romeo** made love to her. Anyway, Lucrecia put the hex on me. I fell in love—and remembered.

Okey. Curtain. Twenty-two years pass. I'm getting older, but my thoughts seem to get younger and Kinsey has confirmed statistically what has happened to the rest. Next act, curtain up.

So I'm in Madrid in this year of 1953, having been urged there by **Frank Howell**, who is TWA's manager in Spain, to partake of the hospitality concomitant (brother, there's a word for you) with the gala opening of the new Hilton hotel.

Second Date: 1953. So I remember this babe in the Prado museum. I had forgotten her name but I well remembered the painter and I also remembered the inlaid checkered frame and the general location. So I ask my friend **Frederik Ludvigsen** of Scandinavian Airlines System if he will drop me off at the Prado so I can find my girl friend of long ago. I pay my two pesetas at the entrance and start looking.

The Prado is a big place but by trial and error I wandered around, not for too long, until I felt I was near the right room. And sure enough, there was Lucrecia on exactly the same wall and in the same spot as she was in 1931 when we first met and in 1913 when Baedeker's was last issued! That's one nice thing about Spain—nothing changes. Not until the USAF activates those new bases, and then watch traditions fall!

I have no doubt that you will concur that I am getting a little old for this lovely, prim Italian girl, but I can't help being a little sentimental about her and wondering what she was really like back there shortly after the turn of the century about 1510 or 1520. What kind of a bloke did she marry? How long did she live? What kind of a home did she have? And how many lovers?

Lucrecia Baccio del Fede

Such is History. And you, Andrea del Sarto, did you make a pass at her while doing this painting job? And could you, Andrea, have possibly dreamed that a guy born in the midwestern part of the United States 400 years later would one day stand entranced by this radiant beauty while on a third class trip through Spain a month before **Alphonso's** monarchy was booted out of the country, and then return 22 years later by flying machine—that very invention which your contemporary Leonardo da Vinci envisioned and sketched while you were painting Lucrecia—to look again at that magnificent reposed face?

History is one of those consoling and enduring things which make life so good. Many things change in this life. But through centuries of strife del Sarto's Lucrecia painted in the Italian city of Florence hangs placidly through the decades of the twentieth century in Spain's capital to be admired in this age of television, Kinsey, **Malenkov** and a Republican administration in the U. S. still operated by Democrats.

Alas. You may well ask me, did Lucrecia a few weeks ago hold within that tight young bosom and those shy but knowing youthful eyes the same fascination which caused me to stop reverently before her in 1931? Well, now, friends, I wouldn't even tell Kinsey the answer to that one. Kinda private, that is. Let's just say that I took a good look and went to the picture desk and bought the photograph which you see on this page.

It didn't help much when the sales girl had to dig deep down under the counter to find a print. Don't worry, Lucrecia, I, at least, remembered, even if you aren't in such big demand today. Alas, Lucrecia lived a long time ago and my memories are sometimes much too capriciously and puckishly long for comfort. Maybe my wife is right when she reminds me how patiently tolerant she is of my whimsies and my restless urge for the Muse.

serving the U.S. Navy...

Marquette **WINDSHIELD WIPERS**

Lockheed P2V Patrol Bomber
equipped with Marquette Wipers

The Marquette
METAL PRODUCTS CO.
CLEVELAND 10, OHIO
SUBSIDIARY OF CURTISS-WRIGHT CORPORATION

Also Manufacturers of:
ROLLER BEARING TEXTILE SPINDLES
WINDSHIELD WIPERS FOR AIRCRAFT
FUEL OIL PUMPS AND INJECTORS
PRECISION PARTS AND ASSEMBLIES
ROTARY HIGH PRESSURE OIL FIELD PUMPING MACHINERY

CHARACTER....

AIR ASSOCIATES, INC.

"The Sign of Better Equipment"

Reputation can be acquired . . . often overnight . . .
and it can be destroyed entirely in the same space of time . . . but character is that priceless thing . . .
built not bought . . . it endures. It evolves slowly through the years out of
achievement and fine works. More than a stamp of approval, character is time's acceptance.
The character of Air Associates has been emphasized by the more than a quarter century of service to Aviation.
Today, the insignia proudly illustrated,
identifies the seller of products . . . designed, produced, and distributed by our company . . .
as the best, regardless of price. When you display this sign you attract the cream of Aviation equipment buyers.
When they purchase they do so with complete confidence in the quality of the product and
the character of the company.

"DO MORE BUSINESS . . . MAKE MORE PROFIT WITH AIR ASSOCIATES' EQUIPMENT"

J. E. Ashman
PRESIDENT

AIR ASSOCIATES, INC.

HOME OFFICE • TETERBORO, N. J.

DIVISIONS: ATLANTA • CHICAGO • DALLAS • GLENDALE • HACKENSACK • MIAMI • ORANGE • TETERBORO

News at Deadline

CAA Jet Team to Be Disbanded January 1

CAA's jet transport evaluation team, which was formed late in 1952, will be disbanded on January 1, 1954. Handling of jet transport certification will thereafter become a routine engineering division function, CAA Administrator F. B. Lee has announced. The team expects to have completed its work by that time, Lee said, and members will return to their former positions in the safety office, where they will continue to work on jet aircraft problems.

George Haldeman, former aircraft engineering division head and team director, will be assigned as special assistant to Safety Director Alfred S. Koch. In this capacity he will continue to monitor and spark plug CAA jet transport activities and to act as technical advisor in safety on such matters as transport helicopter requirements, ICAO participation, and varied international engineering and operational problems.

During its existence the jet team met with representatives of the U. S. aircraft and engine manufacturers, airlines, the Air Line Pilots Association, and representatives of foreign governments. Its activity was highlighted earlier this year by a visit from the British Air Registration Board technicians to discuss certification of the de Havilland Comet III jet transport, now on order by Pan American World Airways for 1956 delivery.

Dissolution of the team as a formal group will have no delaying effect on Comet III certification, CAA officials said. An invitation from ARB for CAA technicians to visit Britain to continue work on Comet certification is still being awaited, they said, and when received, the appropriate personnel will be sent abroad.

National Orders Transport Helicopters

National Airlines has become the first major U.S. Airline to purchase transport helicopters, placing an order for three Sikorsky S-55's.

The first helicopter, scheduled for delivery later this month, will probably be placed in service in the Greater Miami area, G. T. Baker, NAL president, said. The others are being considered for service in the Tampa, Fla., and Norfolk, Va., areas, he added.

F4D Sets New World Speed Mark

The official world speed mark returned to the U.S. as Lt. Comdr. James B. Verdin piloted the Navy's J40-powered F4D Douglas Skyray to an average of 753.4 mph at Salton Sea, Calif. (see story page 13). Temperature during the four runs over the three-kilometer course was 98.5°.

The Skyray's record surpasses the 737.3 mph set with a British Vickers Supermarine Swift F4 in Libya September 25. The USAF is now expected to make a try at the record with its J57 powered North American F-100.

New Facilities Cost $200 Million in 1952

More than $200 million was spent by the aircraft and parts industry in 1952 for new machinery and facilities, the Census Bureau reports. At the year's end the industry's inventory was the highest in the nation for the second straight year, totaling $2.4 billion. At the end of 1951 the inventory figure stood at only $1.6 billion.

The spending total in 1952 was accounted for by $125.3 million in new structures and $78 million in new tools and equipment.

Industry Payrolls At Peak In June

Peak employment for the aircraft industry may well have been reached in June, when employes totaled 731,600, according to the Labor Department's Bureau of Labor Statistics. That figure is expected to remain firm for the next 18 months. Production workers made up 533,000 of the June figure, a decline of 900 from the May total. The overall count, however, was up 1600 from May.

June breakdown by sections of the industry is as follows:

Section	Total	Production
	(In thousands)	
Airframe	445.6	322.6
Engine & parts	163.3	116.3
Propellers & parts	16.4	12.1
Other parts & equipment	106.3	82.0
Entire industry	731.6	533.0

FTC Turns Down Arinc Ground Network Plan

The Federal Communications Commission has denied an application of Aeronautical Radio, Inc. under the terms of which the American Telephone & Telegraph Co. would have installed and operated a new network of ground-to-air communications stations for United Air Lines. The plan was proposed earlier this year and was announced in an exclusive report in AMERICAN AVIATION (April 13).

In denying the application of Arinc, which would have been licensee of the stations, FCC said that it was "unable to find that the public interest, convenience or necessity would be served" by its approval. The Commission further explained that it could not be determined that Arinc would have "sufficient interest" to exercise the responsibility that would be expected of a licensee, and that the ownership of equipment and premises (which in this instance would belong to A T & T) is the most clear indication of the purpose of the applicant to exercise the full responsibility of licensee.

FCC disapproval of the application is seen in some quarters as eliminating the possibility of the plan ever being approved in a routine fashion, meaning that any further handling by the Commission would probably take the form of a hearing. It is not known whether such a hearing will be requested, however, as further action is said to await discussion of the FCC decision by Arinc and A T & T officials.

Competitive Bids for Pacific Airlift

Contracts for airline participation in the Pacific airlift will be let on a competitive basis after November 1. Such contracts, let on a quarterly basis, will require participation of from 4 to 10 aircraft of the airline involved. By June 1 of next year the armed services should be able to handle all the airlift traffic themselves, it is estimated.

First Mentor Delivered

The first production model of the Beech T-34A Mentor trainer has been delivered to the USAF. Quantity production on the low-wing monoplane has now begun. The aircraft is powered by a 225-hp Continental engine.

CAB Issues Coach Policy Statement

The CAB has given a long range endorsement to domestic scheduled airlines' coach services by eliminating the need for specific expiration dates previously required on all coach tariffs. In a significant coach policy statement, the first since December 1951, the agency also made these points

- **Fares for new coach services** will not be subject to specific cents-per-mile ceilings, but will be subject to the condition that such new coach fares do not exceed 75% of the corresponding first class fares.
- **The continued development** of an adequate air transportation system requires the extension of coach services to new points and over new routes, in addition to the expansion of existing services.
- **Specific coach reports** will not be necessary after January 1, 1954.
- **Where operational reasons require** use of a high density (coach) aircraft on a first class schedule, a rule requiring refund of actual fare differences when there is an applicable coach tariff, and a 25% refund when there is no coach tariff, appears sound and reasonable.

Subcontractors Fined For Overcharging

Fines have been imposed on two Detroit manufacturers for alleged attempts to overcharge the Kaiser Frazer Corp. for work on C-119's, according to the *Detroit Free Press*. Edward Mardigian, president of the Marco Manufacturing Corp. and the Mardigian Corp., was fined $40,000; Rudolph Stonisch, vice president of the Mardigian firm and president of Marco, was fined $16,000, according to the Detroit paper. An additional $84,000 was assessed against the two companies.

The Federal Judge Theodore Levin termed the defendants' actions "a case of just plain greed."

Name Two New Directors At North American

Two North American Aviation vice presidents have been elected to the board of directors. Raymond H. Rice (engineering) has been with the firm since 1935 and has been a vice president since 1942. James S. Smithson (manufacturing) joined North American 19 years ago and also became a v.p. in 1942.

Rapid Write-off Program Continues

The rapid tax write-off program for commercial transport aircraft will be continued by the Office of Defense Mobilization, which acted on the recommendation of the Defense Air Transportation Administration and Commerce Secretary Weeks.

Goal for the program will continue to be five-year amortization of 600 twin and four-engine airliners between January 1, 1950 and June 30, 1955. DATA has negotiated approval of certificates of necessity for 367 transports thus far.

Local Lines Offer 1st Class Rate of 45c

The 14 local airlines have offered to carry first class letter mail, newspapers, and parcel post over selected segments of their routes for 45¢ per ton-mile. The proposal was presented to the Post Office and CAB by officials of eight carriers and Donald W. Nyrop, Washington counsel of the Conference of Local Service Airlines.

Stating that 45¢ is a "reasonable" rate, the local lines added that "it may, in fact, result in reduced transportation costs for the Post Office. For example, if the Post Office tenders a 100-pound sack of first class mail for carriage from a small intermediate city to an air terminal 100 miles distant, this would mean that the specific pouch would be transported for 2¼ cents per air mile for a total cost of $2.25."

The proposal contained detailed schedules on which first class mail would be carried and listed the average available unused capacity on each flight. Segments were selected on which "transportation of surface mail . . . will result in substantially improved mail service," it said.

CAB and Non-Sked To Speed Proceedings

A plan to avoid "an expensive and protracted hearing" in the controversial North American Enforcement Proceeding has been agreed to by the Enforcement Office of the CAB and by North American Airlines.

Both parties have filed a "preliminary stipulation" with Examiner William F. Cusick under which a public record will be developed as far as necessary without recourse to oral testimony of witnesses. Hearings scheduled to resume in Los Angeles on October 6 were accordingly called off.

CAB Counsel Urge S&W Five-Year Certificate

Seaboard & Western Airlines, with an apparently big boost from CAB's air operations bureau, has capped its seven-year-old bid for a trans-Atlantic cargo certificate with the claim that the U. S. is losing the lead to foreign airlines in the trans-Atlantic freight field.

In a brief to the Board, S&W said airlines of other countries actually captured 78.6% of the total increase since 1950 with the remainder going to Pan American and TWA.

Meanwhile, CAB Bureau Counsel V. Rock Grundman and Ronald H. Cohen, stating their position for the first time in the case, urged a 5-year certificate for S&W, and denial of somewhat similar applications of Transocean, Flying Tiger, Overseas National, and European-American.

Pan Am, however, contended the U. S. lines were increasing their share of the foreign market with growth "far outstripping that of domestic all-cargo lines, domestic trunk carriers, and the combined American-flag international carriers."

Isenberg Resigns Post

Robert M. Isenberg has resigned as general manager of the Greater Cincinnati Airport in order to serve as chief of the Puerto Rico Transportation Authority's aviation division. He will make his headquarters at San Juan Airport. No decision has thus far been announced in regard to his replacement.

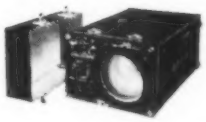
Senator Questions Troop Moves by Air

The Department of Defense is being asked by Sen. John Sherman Cooper, (R., Ky.) why the Army transports troops by plane when there is no emergency involved. Cooper, shocked by the recent crash of a C-46 chartered by the Army in which 23 were killed and 18 were injured, said, "There may be valid reasons why troops like these were being carried by plane. I'm not saying there aren't. I just want to know."

The Senator is a member of the Senate Armed Services Committee and newly appointed chairman of the Senate Civil Aviation subcommittee. The accident, which occurred as a charter flight operated by Resort Airlines was landing at Louisville, Ky., brought to an end over three years of fatality-free domestic flying for the certified scheduled airlines. During that time they had handled 540,000 passengers on official military movements.

Complete Ignition Service

Now Available at Major Airports from Coast to Coast



Executive and personal plane operators can now get the same thorough, efficient and quick ignition service as the commercial air lines enjoy. At major airports across the nation, progressive aircraft service organizations are using the Bendix Ignition Analyzer. They will provide this service for you at 100-hour check periods, major overhauls, or at any other time that a rapid check of your complete ignition system may be desired.

Remember, too, the Bendix Ignition Analyzer can be used either for ground or in-flight ignition checks. Installation for either airborne or portable-airborne use is easily accomplished.

For best preventative maintenance, let the Bendix* Ignition Analyzer check the operation of your ignition at any of the aircraft service organizations listed below.

*REG. U.S. PAT. OFF.

Aircraft Service Organizations Using Bendix Ignition Analyzer

Birmingham, Alabama
Aero Service & Supply
Municipal Airport

Burbank, California
Pacific Airmotive Corp.
Lockheed Air Terminal

Chicago, Illinois
Air Associates, Inc.
Midway Airport

Dallas, Texas
Southwest Airmotive Co.
Love Field

Jamaica, New York
Lockheed Aircraft Service Int'l, Inc.
N. Y. International Airport

Kansas City, Kansas
Pacific Airmotive Corp.
Fairfax Airport

Linden, New Jersey
Pacific Airmotive Corp.
Linden Airport

Miami, Florida
Airwork Corp.
International Airport

Milwaukee, Wisconsin
Anderson Air Activities
General Mitchell Field

Oakland, California
Pacific Airmotive Corp.
Oakland Municipal Airport

Seattle, Washington
Pacific Airmotive Corp.
Boeing Field

Teterboro, New Jersey
Mallard Air Service, Inc.
Teterboro Airport

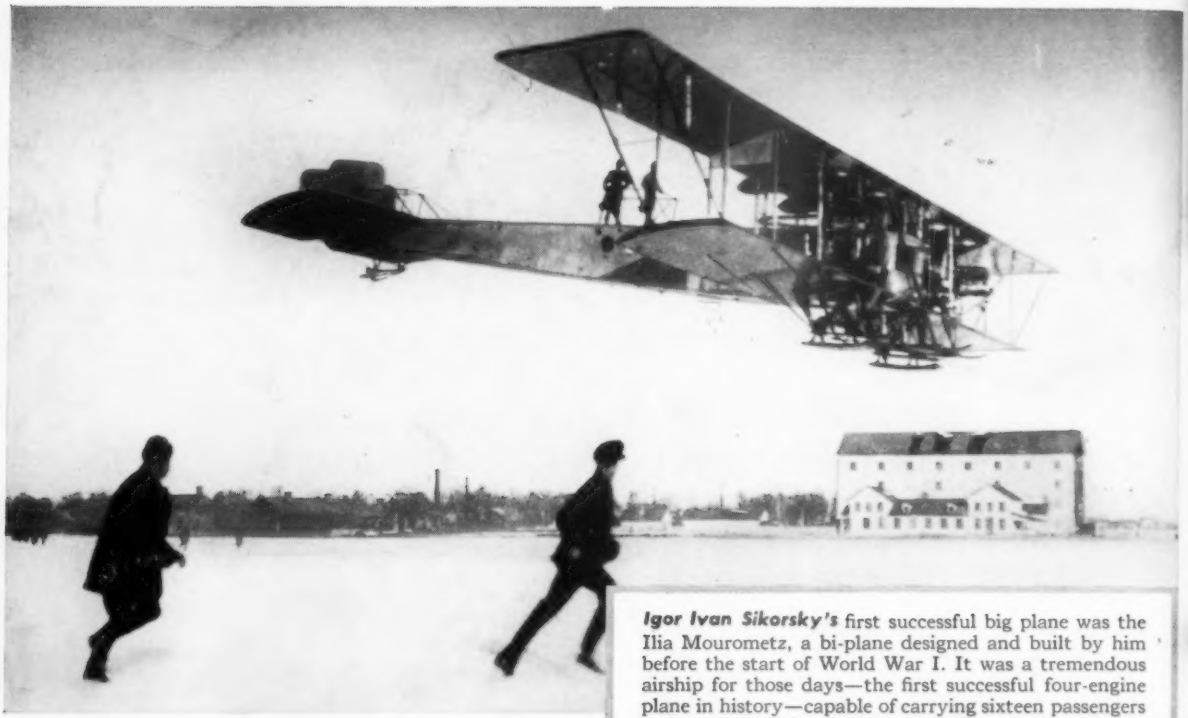
Bendix

SCINTILLA MAGNETO DIVISION OF SIDNEY, NEW YORK Bendix

Export Sales: Bendix International Division, 205 East 42nd Street, New York 17, N. Y.

FACTORY BRANCH OFFICES: 117 E. Providencia Avenue, Burbank, California • Stephenson Building, 6560 Cass Avenue, Detroit 2, Michigan
Brouwer Building, 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California

Sikorsky's First Big Plane—1914



Igor Ivan Sikorsky's first successful big plane was the Ilia Mourometz, a bi-plane designed and built by him before the start of World War I. It was a tremendous airship for those days—the first successful four-engine plane in history—capable of carrying sixteen passengers and a crew of eight. On its maiden flight the Ilia Mourometz flew for over 1½ hours without mishap. Photo above shows the big plane at a demonstration in 1914.

TODAY Igor Sikorsky is still a prominent figure in aeronautics. Having chosen to live in the United States, where the full measure of his genius can be realized, he has made valuable contributions to the progress of American aviation. As Engineering Manager of Sikorsky Aircraft—a Division of United Aircraft Corporation—he perfected the first successful helicopter in the Western Hemisphere. The famous aeronaut is shown above giving final inspection to one of the new Trans-Atlantic H-19 helicopters prior to its flight to Germany in late July 1952.

Over the years the demand for better, more dependable aircraft has been met by the aviation industry with remarkable results. The improvement in aviation fuels has been one of the big factors contributing to the industry's progress.

Phillips Petroleum Company, pioneer in the field of special aviation gasolines and lubricants, has long been one of the country's largest suppliers of aviation fuels for commercial and military use. Today Phillips is ready with new fuels for turbo-props and jets, in addition to its tremendous capacity for producing 115/145 grade aviation gasoline.

Rely on Phillips for the finest in aviation products!

Phillips 66

AVIATION PRODUCTS

AVIATION DIVISION
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

1903 50TH ANNIVERSARY OF THE AIRPLANE 1953